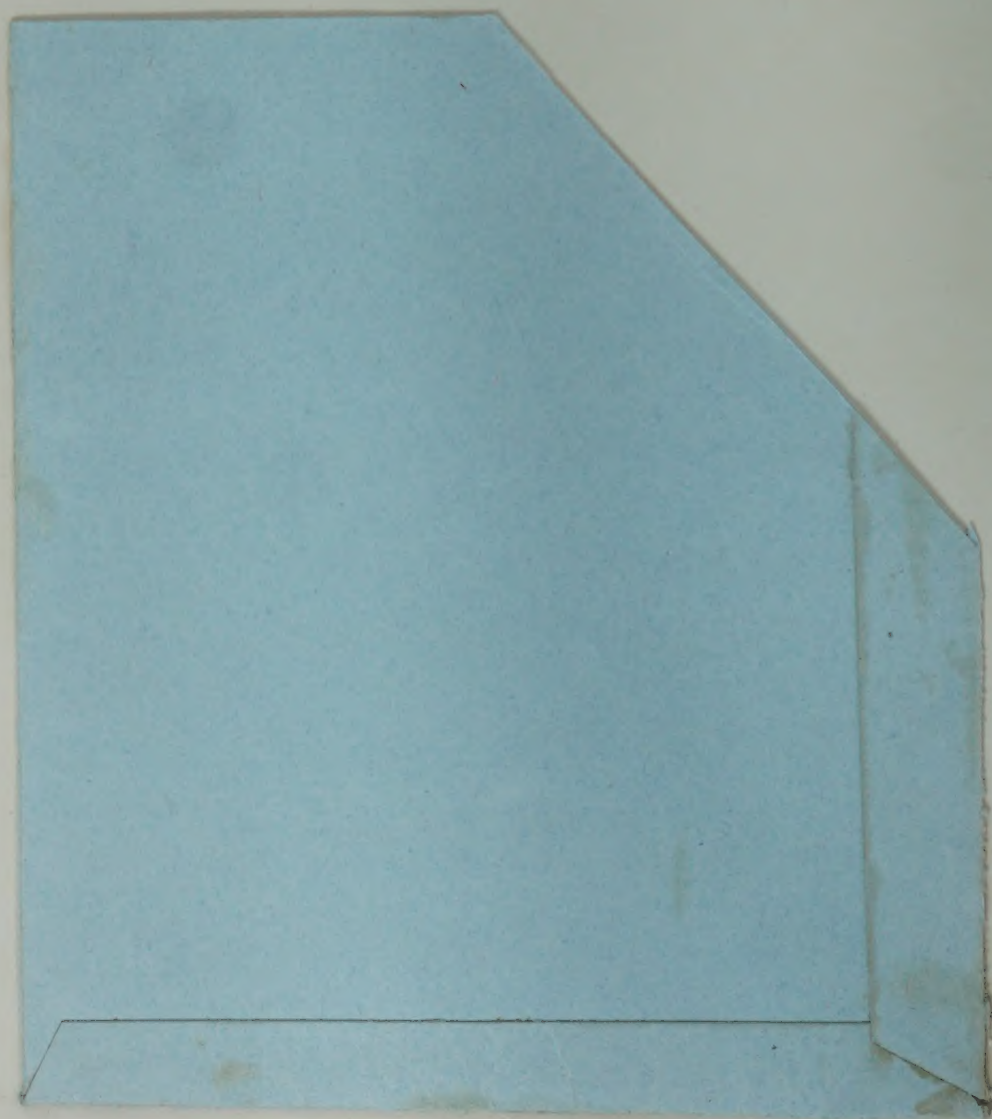


DISASTER PREPAREDNESS

A Handbook for Trainers



**Council For Advancement Of
People's Action And Rural Technology**



COMMUNITY HEALTH CELL

~~47/1-St. Mark's Road, Bangalore-560 001~~

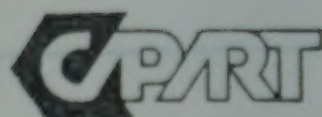
THIS BOOK MUST BE RETURNED BY
THE DATE LAST STAMPED

[illegible]

DISASTER PREPAREDNESS

A Handbook for Trainers

VOLUME - I



**Council For Advancement Of
People's Action And Rural Technology**

For Information Address :

01980
DM-120
COMMUNITY HEALTH CELL
326, V Main, I Block
Koramangala
Bangalore-560034 -
India

CAPART

58, Institutional Area,
D-Block, Pankha Road,
Janakpuri,
New Delhi - 110058.

PREPARE

364, North Main Road,
Anna Nagar West Extension
Madras - 600 101.

FIRST EDITION, 1990

Rs. 120

PRINTED AT : COMPUTRONICS GRAPHIC CENTRE
23/2, V.V. Koil Street, Madras - 600 086. Tel : 455079.

CONTENTS

	Page No.
1. CAPART A Profile.	i
2. PREPARE An Introduction.	iii
3. Acknowledgements.	v
4. Preface.	vii
5. Emergency Rescue and Evacuation Methods. Uses of Ropes.	1
6. Emergency Relief Camp Organisation	27
7. Emergency Medical Care. Uses of Bandage.	47
8. Contingency Plan and Warning System.	97
9. Purification of Water and Sanitation.	133
10. Causes of Fire. Fire Fighting Methods.	155
11. Safe Handling of Pesticides.	179
12. Select Bibliography.	200

CAPART - A Profile

The Council for Advancement of People's Action and Rural Technology (CAPART) is an autonomous body set up under the aegis of the Ministry of Agriculture and Rural Development and has been registered as a Society under the Societies Registration Act, 1848. The objectives of the Council are :

- *to encourage, promote and assist voluntary action in the implementation of projects for the enhancement of rural prosperity;*
- *to strengthen and promote voluntary efforts in rural development with focus on injecting new technological inputs in this behalf;*
- *to act as the national nodal point for coordination of all efforts at generation and dissemination of technologies relevant to rural development in its wider sense;*
- *to act as a catalyst for development of technology appropriate for the rural areas, by identifying and funding research and development efforts and pilot projects by different agencies and institutions particularly voluntary organisations;*
- *to act as a conduit for transfer of appropriate technology to Government Departments, public sector undertakings, cooperative societies, voluntary agencies and members of public, to encourage adoption of modern techniques and appropriate technology in rural development ;*
- *to act as a clearing house of information and data bank;*
- *to disseminate knowledge on rural technology to manufacturers of machine tools, equipment and spare parts so that large scale production of technically improved machinery etc. is carried out in the private, cooperative and public sectors;*
- *to promote, aid, guide,organise, plan, undertake, develop, maintain and coordinate projects/schemes aimed to all-round development, creation of employment opportunities , promotion of self-reliance, generation of awareness, organisation and improvement in the quality of life of the people in rural areas in general and of the economically and socially handicapped sections in particular;*
- *to assist and promote programmes aimed at conservation of environment and natural resources;*

- to strengthen existing institutions of research and develop or set up institutions, so that national level institutions on matters of purely or largely rural interest are built up;
- to collaborate with other institutions, associations and societies in India or abroad including concerned international agencies constitutions of the U.N. system interested in similar objects;
- to conduct or sponsor training programmes, conferences, lectures and seminars on rural development activities of particular interest to women, with an accent on improved technologies appropriate to their role in rural development ;
- to conduct or sponsor training programmes for trainers, particularly in the voluntary sector , so that improved technology is disseminated to participants in development in rural areas;
- to conduct or sponsor training programmes , seminars, workshops and meetings to promote interaction between government agencies and voluntary agencies working in the field of rural development and technology;
- to carry out research studies , surveys, evaluation and the like on the use of appropriate technology and to offer fellowships, scholarships and prizes in furtherance of the projects of the Society;
- to prepare , print and publish papers, periodicals, monographs and books in furtherance of the objects of the Society.

PREPARE - An Introduction....

PREPARE is a non profit voluntary organisation involved in twenty programs in Tamilnadu, Andhra Pradesh and Orissa. Of these programs, the oldest and the core program is the Community Disaster Preparedness Program being implemented in Flood and Cyclone prone districts of Tamilnadu and Andhra Pradesh.

PREPARE and its Community Disaster Preparedness Program owe their origin to the 1977 Machilipatnam disaster when more than 10000 lives were lost on account of lack of preparedness. Some of the people who were involved in the post disaster relief at that time were frustrated at the irreplaceable loss of lives and destruction to properties and sought an effective alternative, pre disaster intervention. Their search led to the birth of **PREPARE** and a process of learning, teaching and doing.

The learning phase included sponsoring staff to undergo trainings in Institutes, Academies, Colleges and Centres in India, Asia and Europe. **PREPARE** now has a team of instructors who are alumni of CDI - Hyderabad, CDA - Bangalore, NCDC - Nagpur, ADPC - Bangkok, AUI - Paris and CRED - Brussels.

The teaching phase included identification of volags working in coastal districts of Tamilnadu and Andhra Pradesh, collaborating with them to organise training programs to the community prone to floods and cyclones in these districts, training and organising village level volunteer forces from among the youth of these prone villages, training special groups of Government officials including Police, Homeguards, Fire service, Fisheries and Revenue officials. The staff of **PREPARE** are now guest faculty in CDI and ASCI - Hyderabad. **PREPARE**'s efforts in that direction is recognised by UNDRO.

The doing phase included participation in District level contingency committee consultations, organisation of seminars and workshops on disaster related aspects like relief camps, drought studies, pesticide studies, management of livestock during a disaster, early health measures in major disasters etc. activating trained volunteer forces during recent disasters and participation in relief and rehabilitation program during recent cyclones.

The impact of the pre-disaster training and during disaster action could be seen from the fact that while May'90 cyclone had more than 200% velocity of that of 1977, the casualty was less than 10%.

PREPARE intends to bring out a series of publications in this International Decade For Natural Disaster Reduction. This manual is the first such publication and is supported by CAPART. It is being printed in Tamil and Telugu also. While continuing to play a trainer's role in Tamilnadu and Andhra Pradesh **PREPARE** hopes to build a large trainer force and spread the concept of community disaster preparedness to other parts of India through this manual. This manual would provide supplemental reading to intending trainers. But practical training sessions with **PREPARE** is necessary to make the reader a complete trainer.

Acknowledgements

This handbook, developed at PREPARE on behalf of CAPART is a guide for trainers. It is the result of a collaborative effort of the Community, the various Voluntary agencies and Institutions.

The entire project was funded by Council for Advancement of People's Action and Rural Technology (CAPART), New Delhi. I greatly appreciate the continued support and encouragement provided by CAPART since 1987.

Reputed Institutions in India also provided support. The ideas were also drawn from the material provided by the National Civil Defence College, Nagpur and the Civil Defence Academy, Bangalore. Acknowledgement is also due to the Civil Defence Institute., Hyderabad for reviewing a part of the manual and also for providing training to our field team.

Gracious thanks are also in order to the Directorate of NCC, Tamil Nadu, for their advice.

The Coast Guards, Naval Coast Battery, Tamil Nadu, provided the relevant practical training and Indian Meteorological Department, Madras, contributed to our understanding and implementation at the field. The help rendered by them is greatly appreciated.

Thanks are due to Mr. Patel, a friend, who was kind enough to share his Civil Defence experience with us.

A guide of this kind is obviously the outcome of a team work. I wish to thank the PREPARE staff for the effort they have put in towards the publication of this handbook.

I wish to acknowledge and thank the authors for their painstaking work in preparing the manuscript.

Credit goes to Dr.Daisy Dharmaraj, Director, PREPARE, for writing the section on Emergency Medical Care and the section on Purification of water and sanitation. She, along with Mrs. Sudha Murali, our Programme Co-ordinator, Hyderabad Office, also prepared the manual on Emergency Rescue and Evacuation.

Mrs. Sudha took great pains to prepare the sections dealing with Post-disaster Relief Camp Organisation and Safe handling of pesticides.

The Co-authors of the section explaining the Causes of Fire and Fire Fighting Methodology were Mrs.Sudha and Mr.Samuel Manuel, our Project Co-ordinator, Nagapattinam Office.

Mr.K.Elangovan, our Programme Administrator at Madras was responsible for preparing the section on Contingency Plan and Warning System.

The Project was field tested by Mr.Samuel Manuel at Nagapattinam and the feed back sent by him has been included in the following pages.

Special mention must be made to the line drawings of Mr.Sathyan and Mr.Chandoo. The manual would be incomplete but for these illustrations.

My appreciation to Dr.Indumathi Ravishankar, Associate Editor of PREPARE, who has looked after the compilation, editing and printing of the manual.

I express sincere gratitude to HIVOS who helped us in the formative years to initiate the concept of Disaster Preparedness.

I am greatly indebted to Christian Aid and OXFAM for their continued support since 1985. But for their encouragement, we would have found it difficult to sustain in this field.

*21-12-1990
MADRAS*

*Dr. JACOB D.RAJ
Executive Secretary,
PREPARE.*

PREFACE

Natural disaster is a recurring phenomenon from time immemorial. The trail of devastation it leaves behind plunges people into a state of confusion, helplessness and suffering. It disrupts the ordinary life of people, disorganizes public services and causes physical damage. And, we can do practically nothing to prevent the natural disaster from happening. What we can do is plan in advance and prepare the community in the region prone to calamity to face the situation without delay and panic. Timely action by the community can alleviate many of the grave consequences of disaster.

Disaster Preparedness - A handbook for trainers is intended to provide an overview of the measures undertaken at the time of emergency. Emphasis throughout is on community preparedness. The traditional practices and initiative of the community is of major importance in any emergency situation. Hence the use of indigenous resources are discussed in detail with pictorial representation using minimum script.

What the book depicts may be common knowledge but in emergency situation, even common sense knowledge fails. Moreover, to put into practical use what one vaguely knows may be dangerous. Herein the handbook comes handy. It can serve as the basic reference material for the training program imparted to the youth in the villages.

This manual is divided into seven sections, each covering a topic usually confronted in an emergency. The first section discusses the rescue measures taken to evacuate the stranded people. It explains methods of transferring people from disaster spot to a safe place. Temporary shelters should be erected and atleast two meals and clothing should be provided. The second section explains the camp organisation methods.

Once people are shifted, attention should be given to the injured. Emergency medical care is discussed in detail in the third section which includes the uses of bandages. Any pre-disaster

preparation involves a thorough planning. The next section on contingency planning gives guidelines to prepare the community wherein the elders are consulted and the youngsters are trained. This section also deals with warning systems since many natural disasters are related to meteorological conditions. Hence, an understanding of weather forecastings is necessary for the trainers so that the community involved is convinced of the impending danger.

This is followed by a detailed discussion on purification of water and sanitation methods. This helps to arrest many water borne diseases. Fire is another destructive agent which is man-made and sometimes accompanies natural disasters. The section on fire elaborates upon the causes of fire and the methods to fight it.

The last section deals with safe-handling of pesticides. Though not directly related to natural disaster, this section has been included in the manual since it is a 'slow disaster' which affects our environment and people. The knowledge of basic safety measures in purchase, storage and use of pesticide is essential. This section also discusses the alternative methods of pest control.

The objectives of this handbook are:

- *To enable people to have an overall idea of the skills and the trainings needed to combat disasters.*
- *To provide the task force a means of preparing themselves to deal with the abnormal conditions following a catastrophe.*
- *To put forth acceptable, made-to-easy standards that can be applied in disaster situations.*
- *To serve as the basic reference book for all trainers within the community or volags in disaster prone areas.*
- *To help trainers organise training program well before the disaster.*
- *To help organising pre-trained youth into a volunteer force during disaster.*
- *To enable replication of the **PREPARE** training module in other disaster prone areas of the country.*

This handbook will soon be followed by a second volume which will discuss the Housing in the disaster-prone areas and care of live stock.

Violent winds, heavy rains and floods often destroy the existing structures and installations. Buildings may have collapsed and roads washed away. Hence, the present structural system of housing in disaster prone areas needs an evaluation. There is a need to design low-cost, damage resistant housing in these areas.

The second volume will also elaborate upon the shifting and maintenance of live stock during disaster.

It is hoped that a cross referencing between the two volumes will assist the reader.

EMERGENCY RESCUE AND EVACUATION METHODS



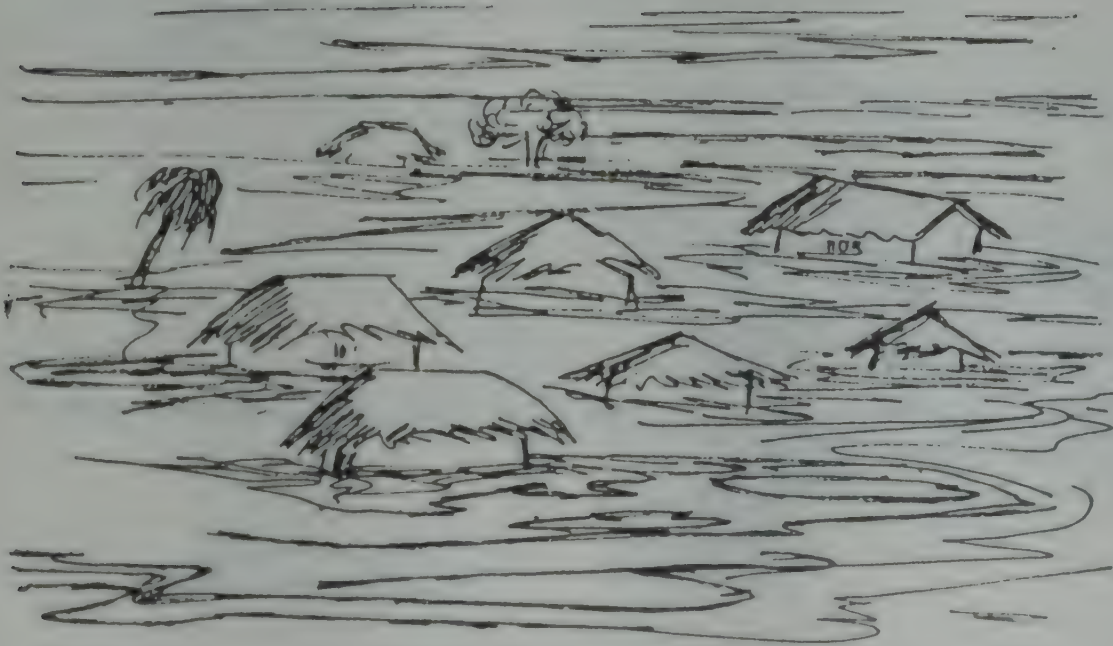
THE UNIVERSITY OF CHICAGO
LIBRARY

Search, Rescue and Evacuation are the immediate task of the volunteer group within a community during or in the immediate aftermath of a cyclone, fire, building collapse, flood, etc. It is therefore necessary that a trained community know the best and available means to achieve this using locally available resources, financially within their reach.

In the manual, Emergency Rescue and Evacuation are outlined, simple yet effective ways to keep afloat during a flood or cyclone. This is a key factor for survival especially for non-swimmers, women, and children. Different types of floats individual or family units, methods of rescue in water, evacuation techniques in smoke filled rooms, use of ropes in lifeline throws are illustrated.

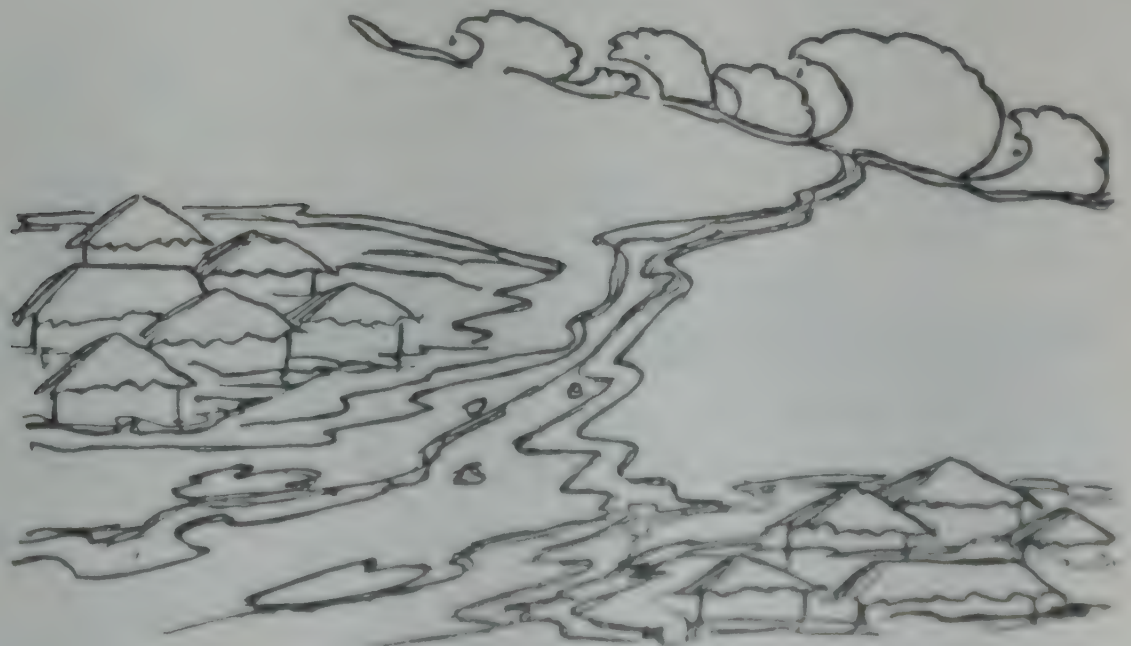
EVACUATION

Shift At The Earliest



Water from the sea inundates villages directly and by flooding the rivers.

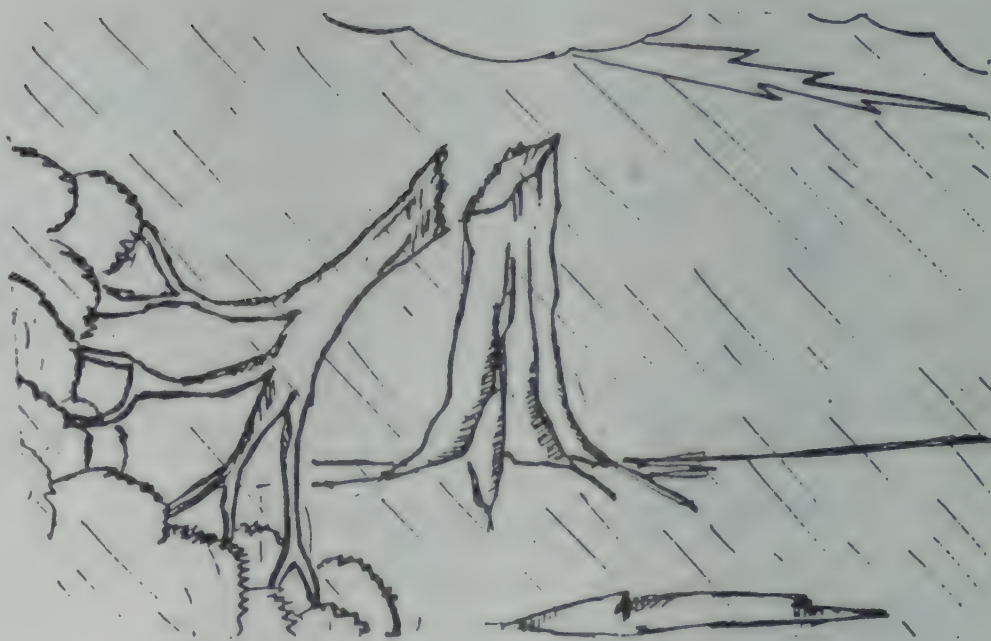
Villages in the lowlying areas are inundated easily.



Floods destroy houses. The mud walls break down. The roof is damaged due to wind and rains. The foundations also are damaged due to water seepage.



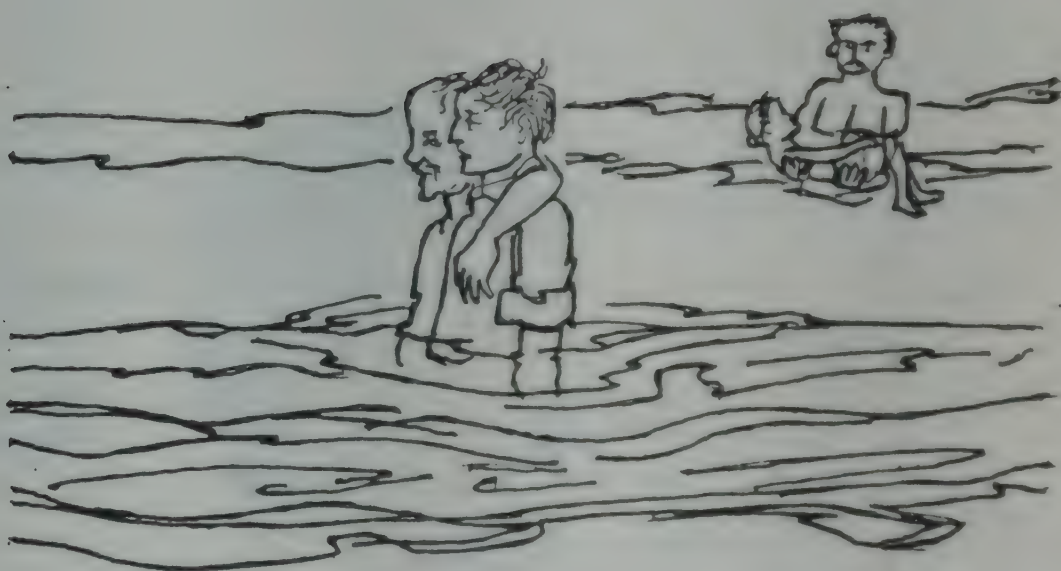
Even well rooted trees fall down ... let alone the vegetations and crops. Much damage is done due to falling of trees.



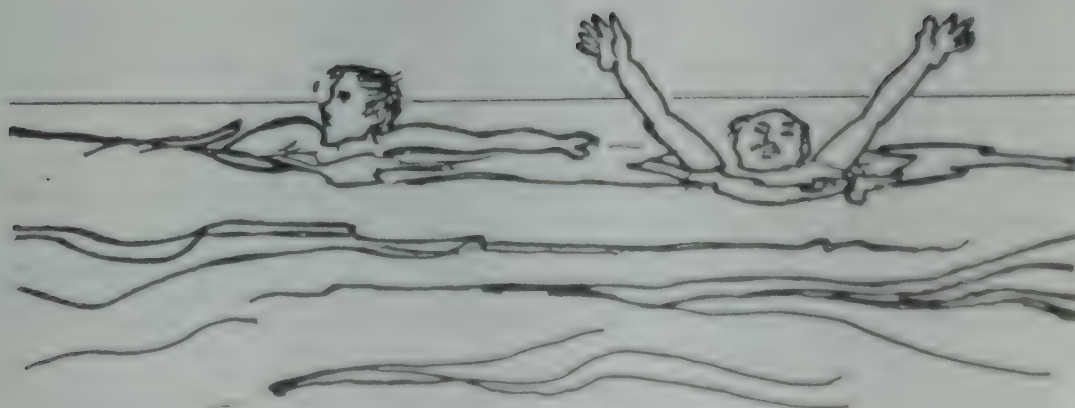
The elderly are vulnerable to floods and are the first to succumb.



The women and children are equally vulnerable.



Trying to save another drowning person, without knowing the techniques is dangerous.



Pre-planned timely evacuation has to be coordinated by taskforces.



RESCUE

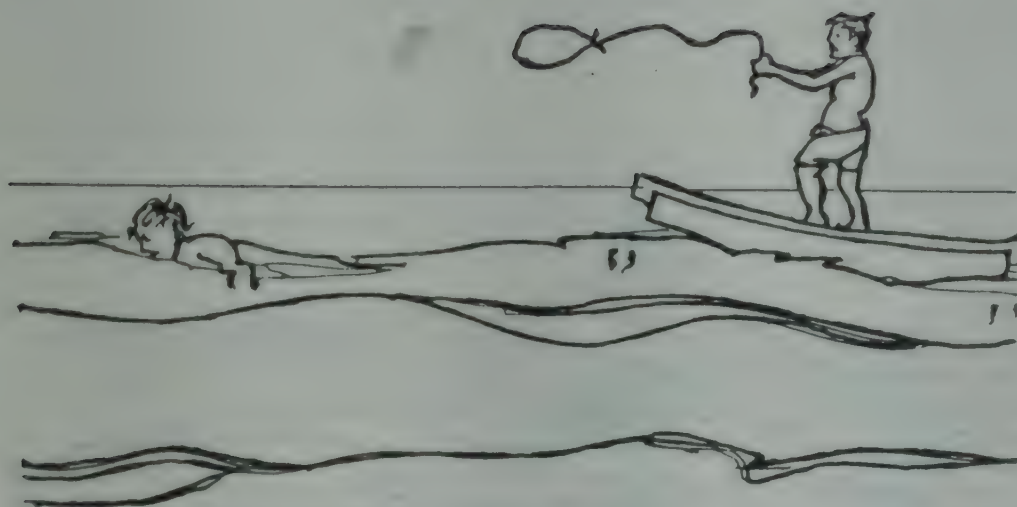
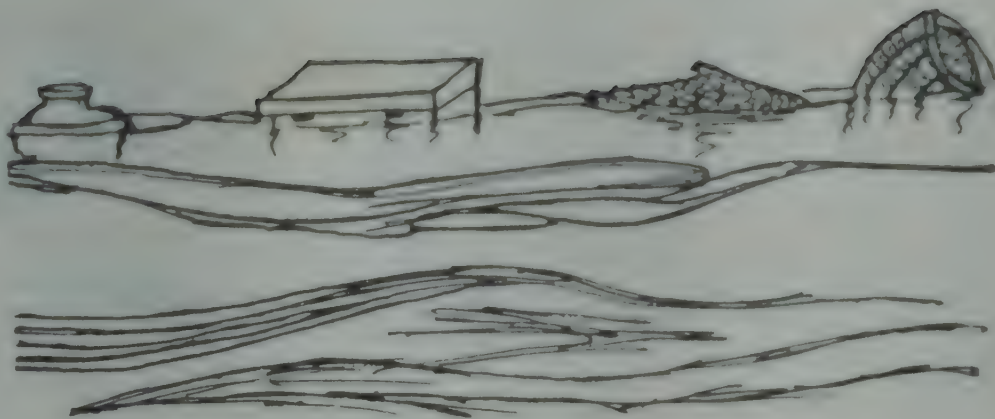


The task force is responsible to warn the villagers of the impending cyclone, and the damages expected. It should clearly instruct where, when and how the people should reach a safe shelter.

One who knows swimming can rescue another by holding on to the tuft of her hair and pulling her.

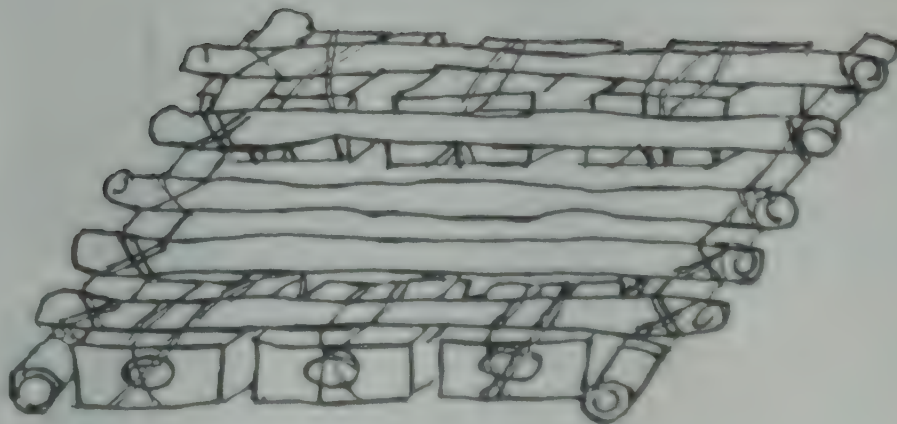


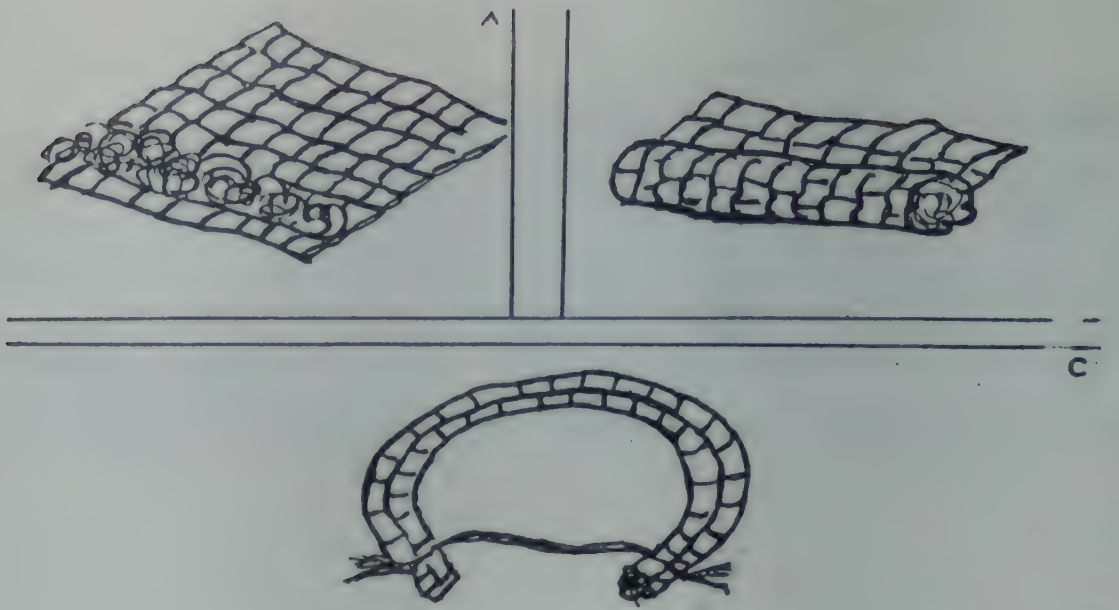
Any other floating equipment like empty tins, pots etc. could as well be used, if tested earlier.



The bamboo float also helps to save others.

Bamboo sticks tied together with empty closed tins as shown could well serve as a float.

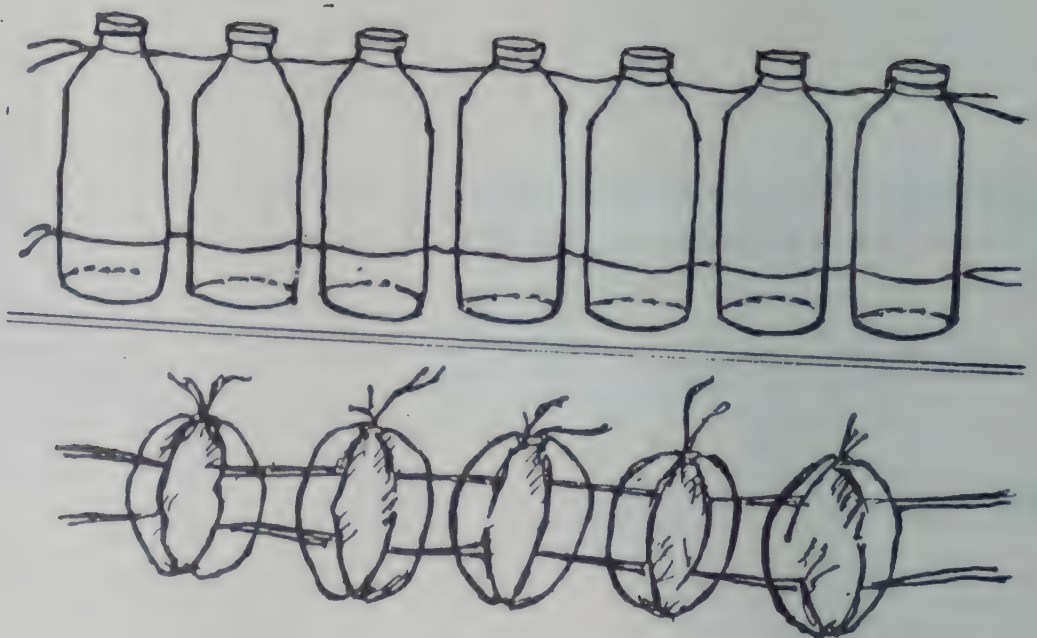




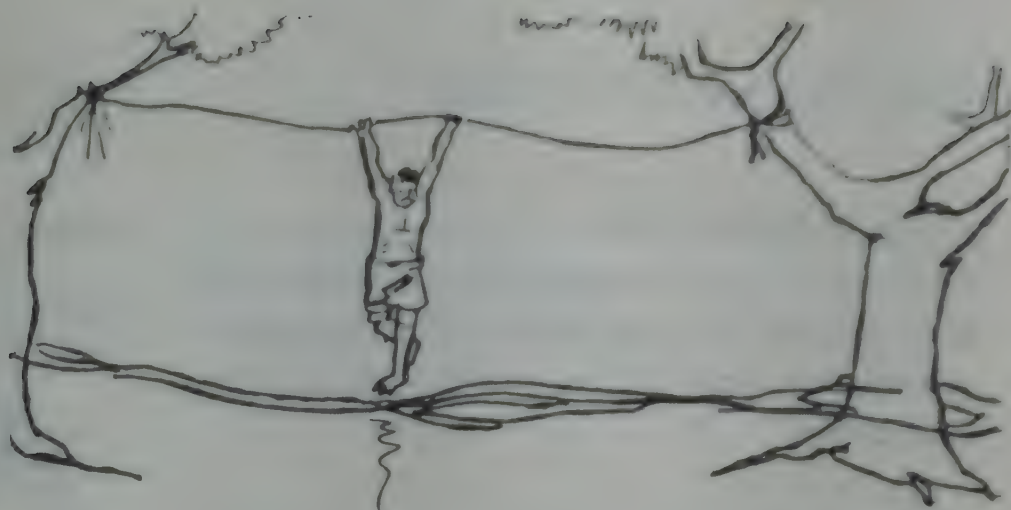
Yet another float could be made by wrapping hay around a mat. Tie both ends tightly and together, and float in the middle.



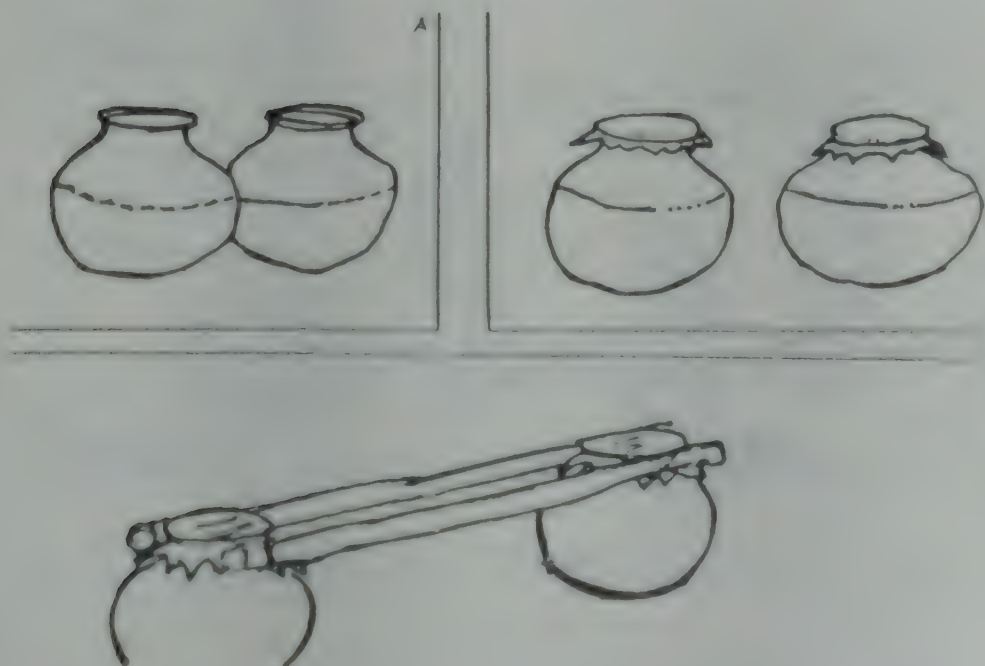
Empty bottles or dried coconuts tied to each other or together could carry a man's weight, and are useful as a float.



To cross a flooded area, secure a rope on trees on either side of the area to be crossed. Use clove hitch. Using this rope, one can cross over.



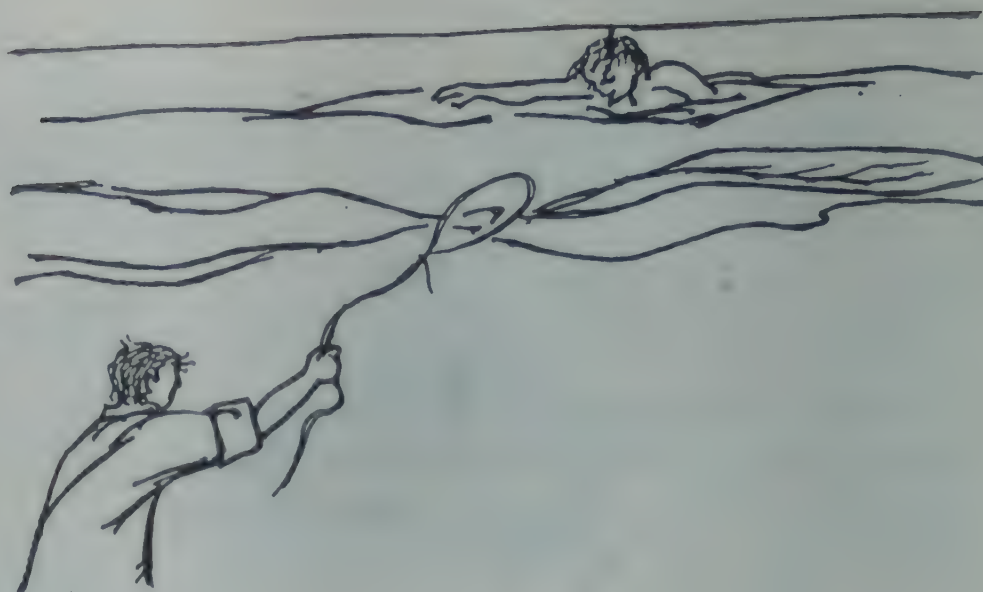
Pots for Rescue



Cover tightly the mouths of two pots or tins with polythene paper. Tie the pots to two bamboo sticks as shown in the figure and float it upside down to the victim who could hold on to it and float.

BREAST LINE THROW

A coil of rope is held in the left hand. At the free end a loop is made with a bowline knot and thrown to the victim who secures it around his waist or hand. Then he could be pulled out.



PRECAUTIONS TO BE TAKEN

Do not set out to sea if the sea is rough.



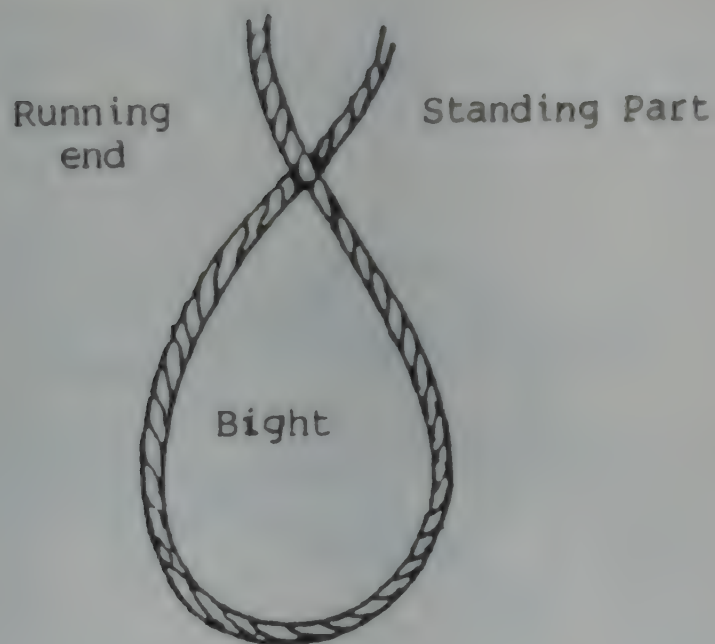
At the earliest, seek shelter in a well maintained cyclone shelter or any safe building. Only carry the most essential things.



USES OF ROPES

Rope is essential for rescue work. The rescuer must familiarise himself with the type of ropes and the knots made with these ropes. It is basic in camp making, water craft, rescue operation and evacuation of casualties in situations created by disasters.

PARTS OF A ROPE



Running End: The free end of a rope with which the knot is made.

Standing Part: That part of the rope which is taking the load.

Bight : A bight is formed by turning the running end of the rope so that it remains parallel to the standing part.

Overhead Knot :



This is an ordinary knot which we use in our day to day life otherwise known as thumb knot. Make a loop and again pass the running end through the loop, it is called overhead knot.

KNOTS FOR JOINING

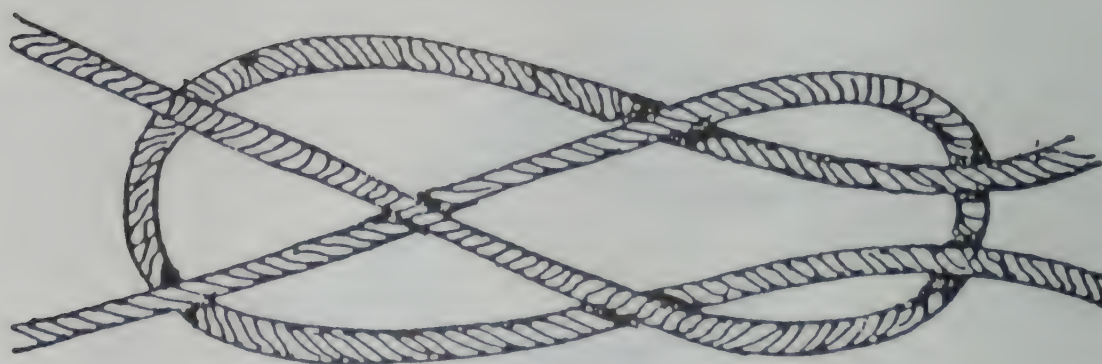
Reef Knot



This is essentially 2 thumb knots tied in reverse direction, left over right and then right over left.

Put the two rope ends together, left over right and twist the left hand end behind and around the right hand end. Bring the ends up and even with each other. Now place the right hand end over the other and twist it behind and down through the bight. Grasp both ends with fingers and thumbs and pull ends out to form the knot. This knot is used for joining two dry ropes of equal sizes.

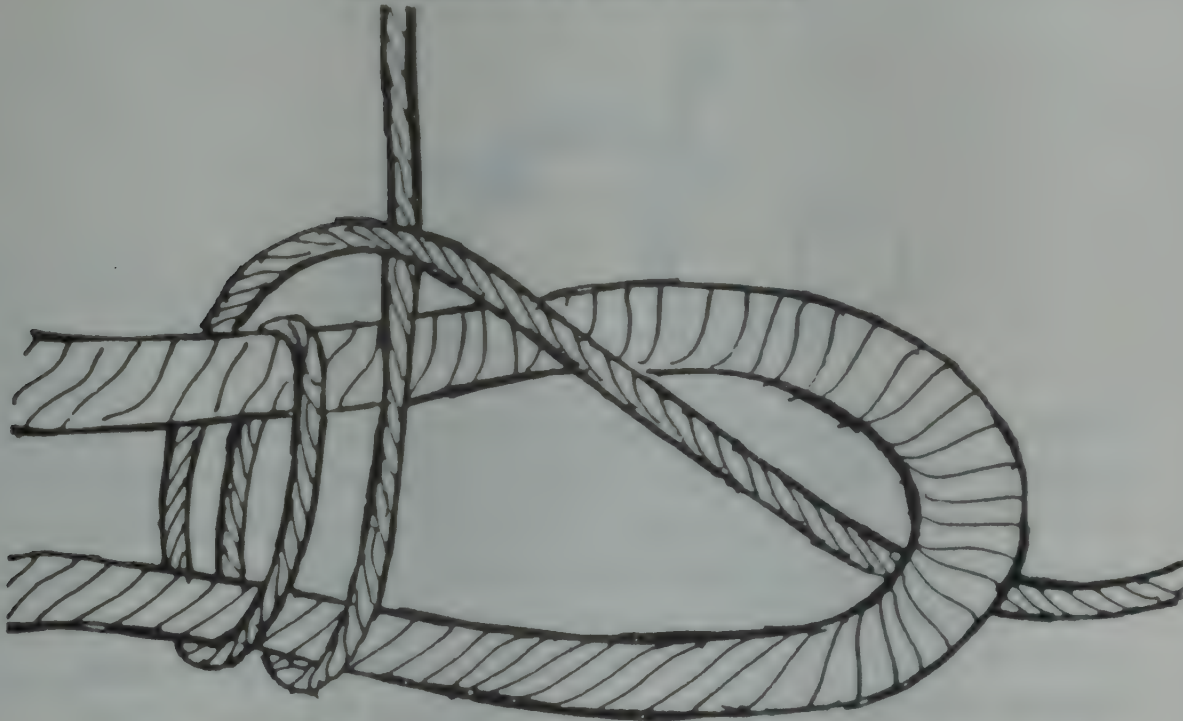
Sheet Bend



There are two types. Single sheet bend, double sheet bend. Both are useful for uniting two ropes of different thickness and they do not slip when the rope is wet.

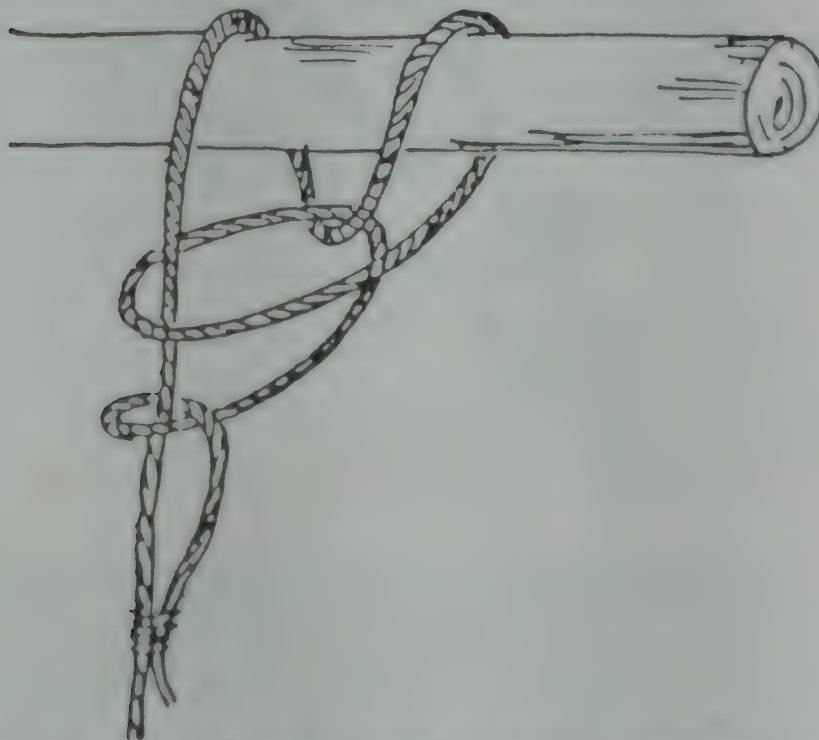
KNOTS FOR ATTACHING

Double Sheet Bend



This is little more secure than the single sheet bend. It is used when the difference between the ropes to be joined is great. It is formed somewhat like the single sheet bend upto forming the bight and passing the thinner rope under the bight and then making two turns over and around the bight before slipping it under its own standing part where this has entered the bight.

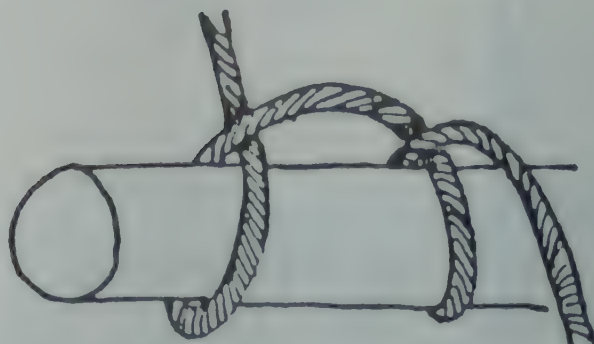
Fisherman's Knot



This is one of the best knots for tying fine ropes together. Tie an overhand knot in one of the ropes but do not pull it. Pass the other rope end through this overhand knot and along side the first ropes standing part. Then tie an overhand knot in the second rope around the standing part of the first rope. Pull each of the two overhand knots separately. Then pull the whole knot by pulling in the two standing parts, thereby interlocking the two overhand knots

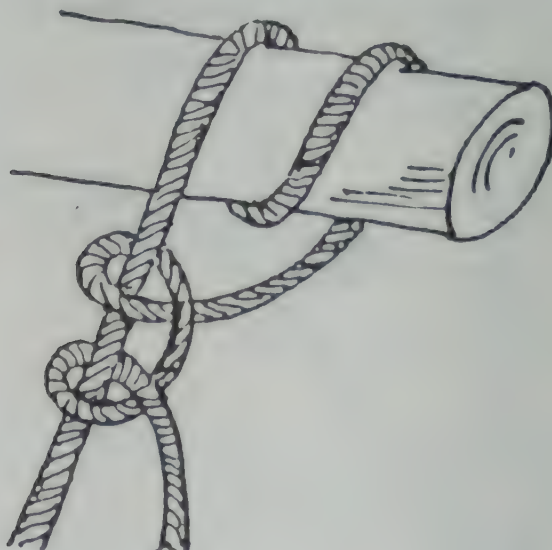
KNOTS FOR SECURING

Clove Hitch



Clove hitch is the most widely used knot for tying the rope around some object, pole or tree etc. and as the start/finish knot of most of the lashings. Pass the running end of the rope around the pole and bring the end forward over its own standing part. Pass the rope end once more around the pole below first turn. Then bring the end in under the rope itself. Tighten the clove hitch by pulling hard on the running end and standing part. The second method of tying clove hitch on the mid-rope is by forming two loops in the centre of the rope, one in the left hand, the other in the right, one opposite to the other in direction. Then the right hand one is placed in front of the other loop. Both loops can be passed over the pole and drawn tight into a clove hitch.

Two Half Hitches

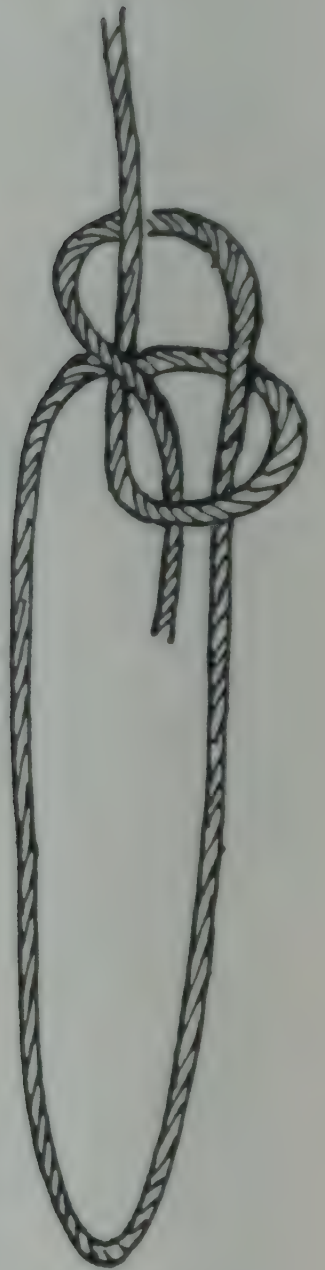


Two half hitches are good for fastening a rope to a post. For this knot, pass the running end of the rope around the pole then over and under its standing part through the loop formed. Make the second half hitch in front of the first by repeating the process of bringing the running end over, under and through the loop formed. Push the two half hitches close together and up against the pole. Then by pulling, the standing part of the knot can be tightened.

KNOTS FOR RESCUE

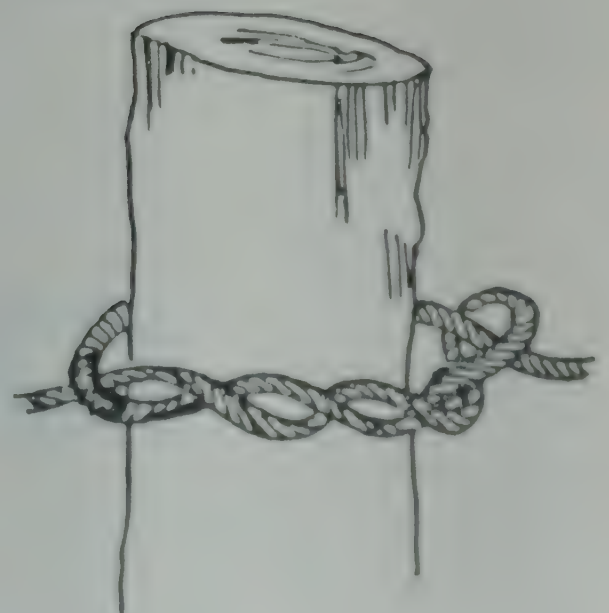
Bowline

This is fundamentally a rescue knot which the rescuer ties around himself or throws to some one who needs a life line. Place the running end on the standing part of the rope. With a twist of the hand carry the end around, forming the loop in the standing part. Bring the running end around the standing part and down through the small loop just formed and along side of its own continuation. Tighten the bowline by holding on to the bight formed by the rope end and pulling in the standing part.

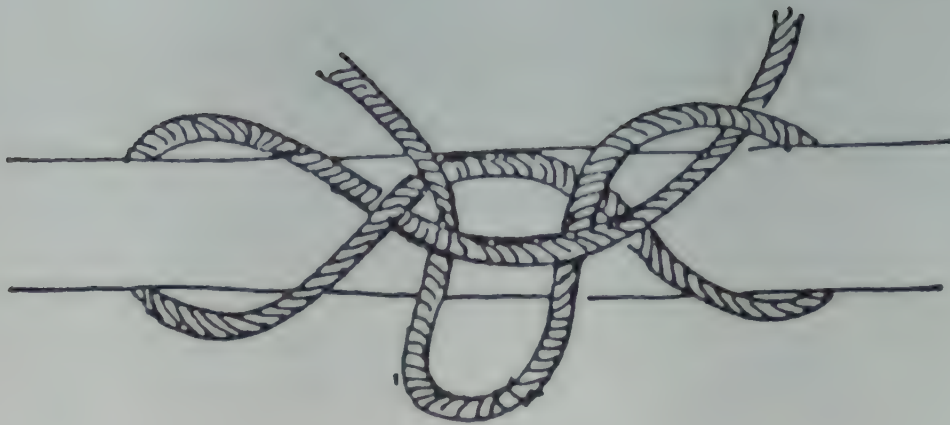


Timber Hitch

This knot is used for quick and temporarily securing a rope to a plank or a spar. This is also fine for raising logs, for dragging them over the ground or for pulling them through water. Pass the running end of the rope around the pole, then under and over its own standing part and through the loop thus formed, make a bend near the rope and twist the end a number of times around the loop till the running end is exhausted. Then pull the standing part and the hitch is formed.

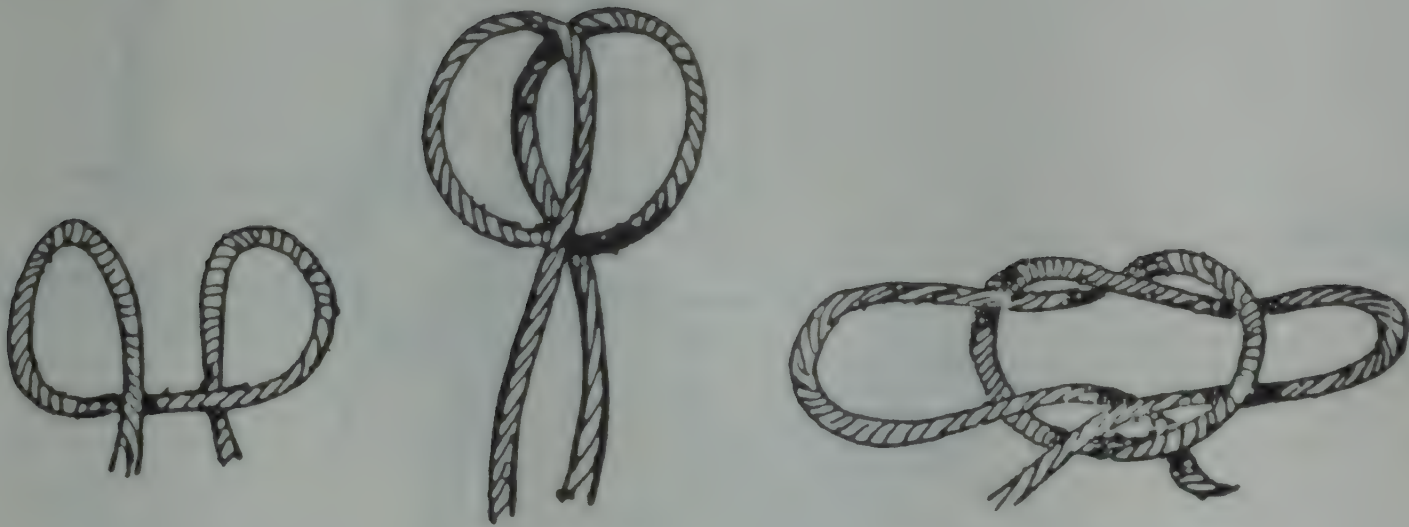


Draw Hitch



This knot is used for self rescue and then recover the rope very easily. This hitch will stand a considerable amount of strain on the standing part and it can be easily released by jerking the free end. This is otherwise popularly known as 'thief knot'. A bight is formed and passed around the spar and a second bight which is then formed on the standing part of the rope is passed through the first bight. A third bight is formed with the short end and passed through the first bight. One more bight is formed with the short end and passed through the second bight and the whole tightened up by pulling on the standing part.

Chair Knot



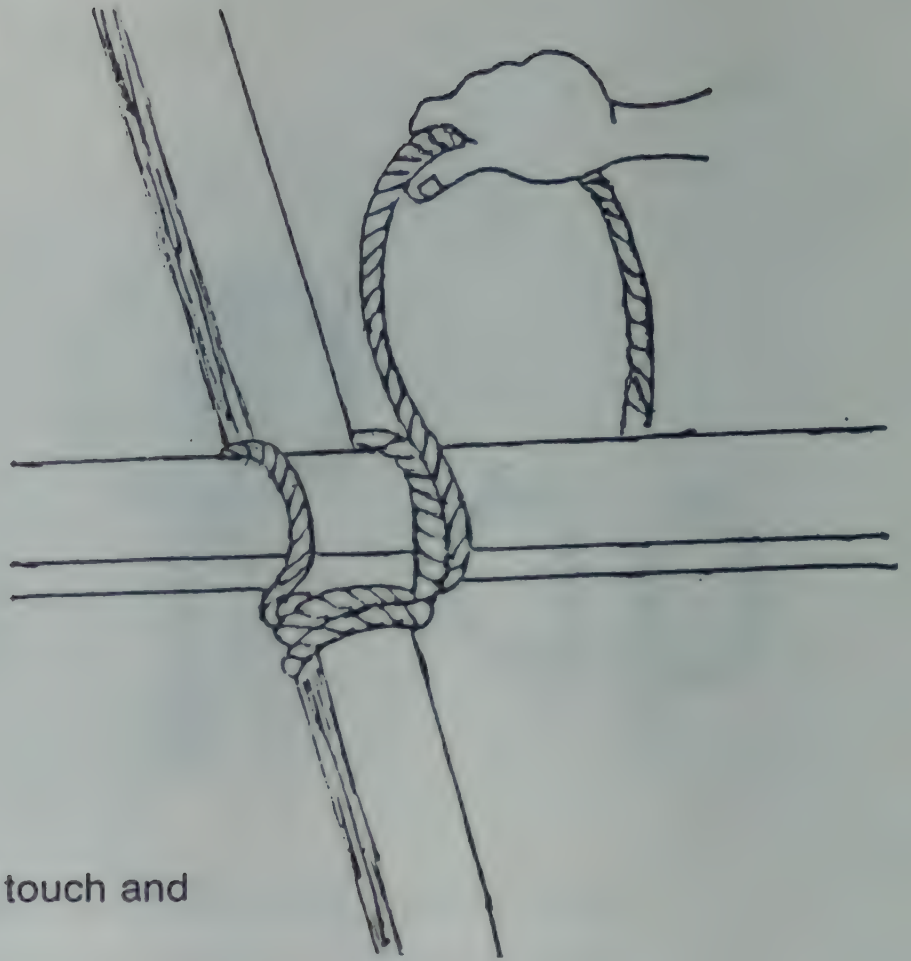
This knot is a good general purpose knot and one which is very important for emergency rescue work. Its purpose is to form an efficient and quickly made sling in which a person may readily be raised or lowered. The sling formed by this knot gives support to the chest and legs of the person being rescued.

The chair knot is formed by grasping the rope, near its centre, in the left hand, palm down. Approximately a yard from the left hand take the rope in the right hand, palm uppermost. Turn the left hand palm upwards forming a loop (anti-clockwise), turn the right hand palm down forming a loop, bring the loops together, then pass the standing ropes through the loops of the opposite hand pulling them through thus forming two loops with a knot in the centre. These loops can be adjusted to the required size. A half-hitch is then made on each loop to keep them at their required size. One loop will be slightly larger than the other to keep the person being raised or lowered in a "chaired" position.



LASHINGS

Square Lashing

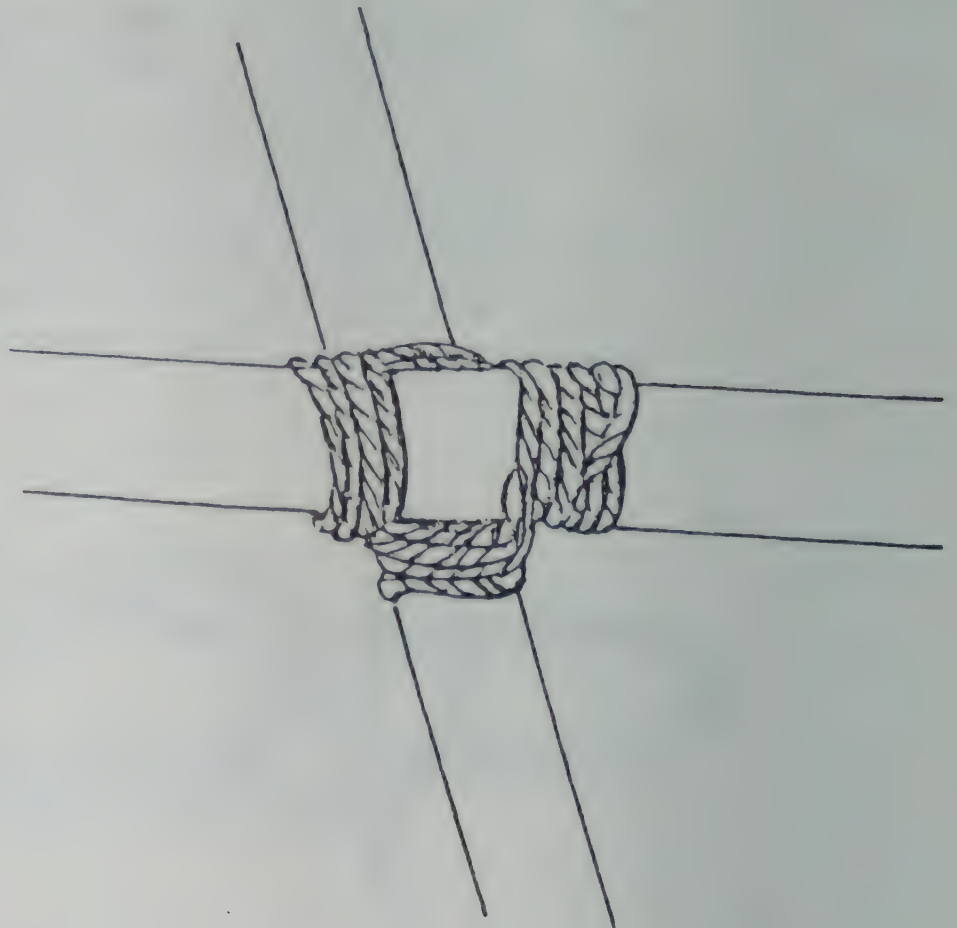


This is used for lashing together two poles that touch and cross at right angles.

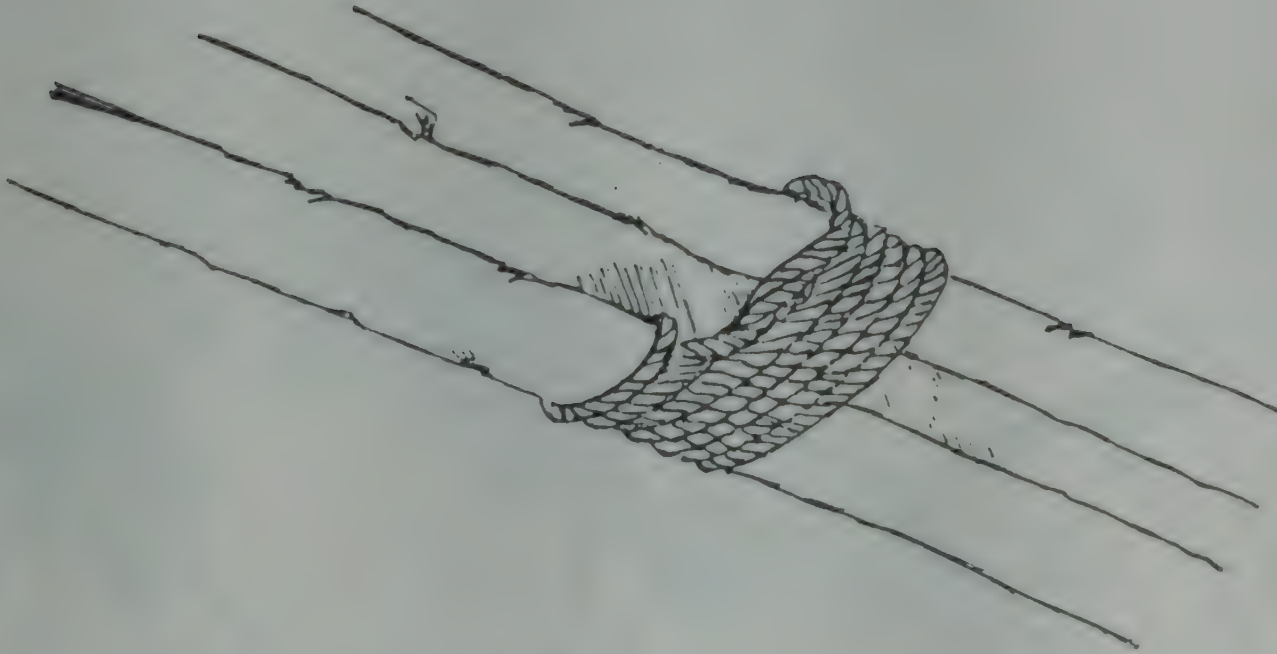
Put a clove hitch to start with around the spar or leg and below the cross head or leader. Carry the running end to standing parts, take up and around both the poles.

Repeat this circuit three to four times drawing the rope as taut as possible. Then take three to four frapping turns around the whole lashing but between the poles.

Draw vertical pole above the horizontal.

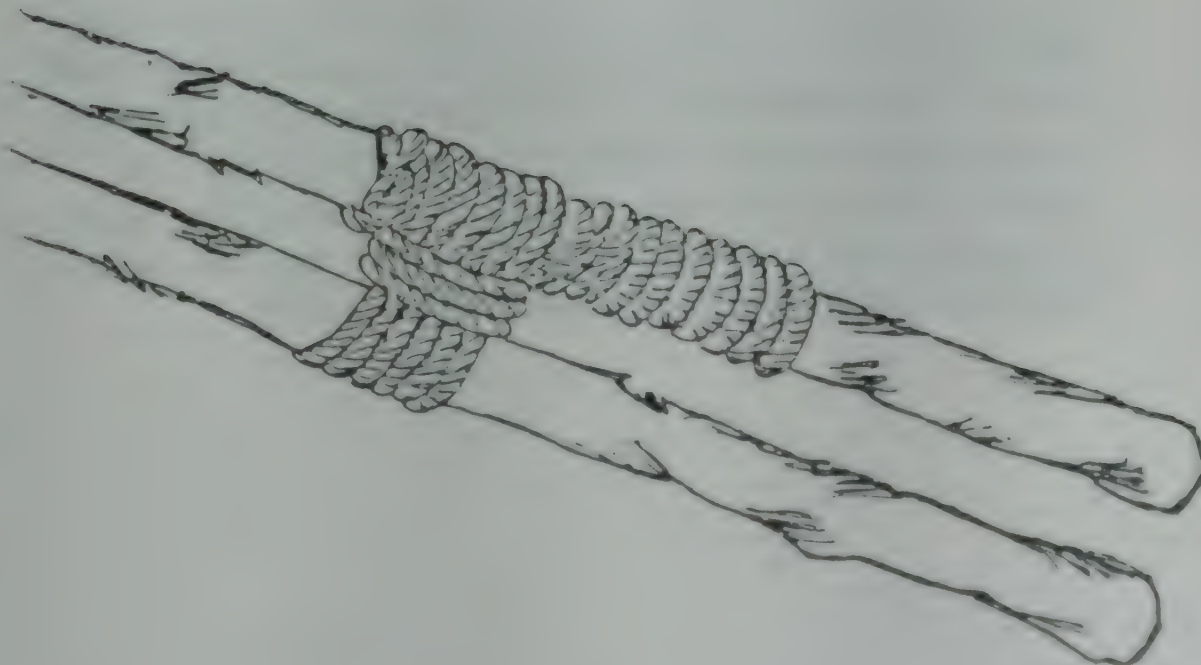


Round Lashing

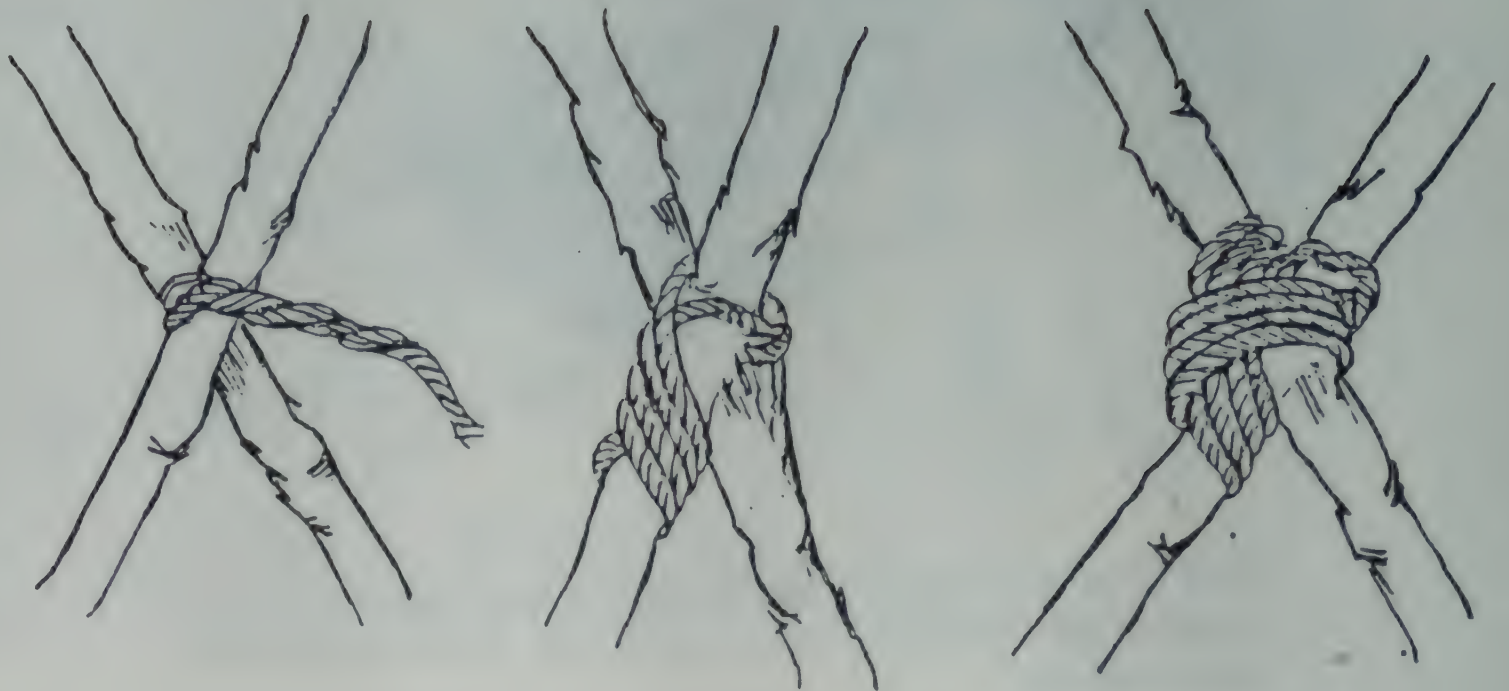


This is used for lashing two poles together, when they are kept parallel to each other e.g. sheer legs. This is also called sheer lashing.

Before starting insert spacers between the poles. The thickness of the spacers should be approximately half the diameter of the poles. Put a clove hitch around one pole, marry the ends and continue with 6-8 close turns round both the poles going upwards. Add two or three frapping turns round the lashing and between the poles. End with a clove hitch above and on the opposite pole to the starting pole.



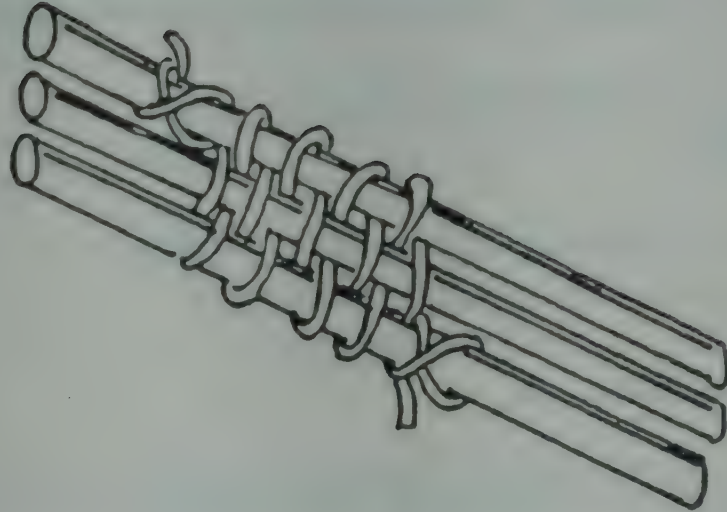
Diagonal Lashing



This is used to fix spars together at other angles, eg. when applying bracing spars to a frame.

Start by means of a timber hitch to hold the two spars together, four or five lashing turns are made around both spars in one direction followed by the same number at right angles to the first set, each turn being pulled tight as it is applied. Three or four frapping turns are then applied tightly by passing the rope between the spars and the lashing finished off with a clove hitch above the lashing.

Figure of Eight Lashing



This is used for lashing three poles together to form a tripod or gyn.

Before lashing, insert spacers between the pole. (Where you have marked the pole). The thickness of spacers should be half that of the poles, marry the ends and working upwards continue lashing in the figure of eight fashion with 6-8 turn. Add two to three frapping turns between each pole and round the lashing. Finish with a clove hitch above and on the opposite pole to the starting pole.

CARE OF ROPES

Since the ropes are the lifelines during Emergencies, proper care should be taken for its maintenance and durability.

- Fibre ropes should be kept as dry as possible.
- Hard and stiff rope gives trouble sometimes. Twists should be removed by stretching a rope throughout its length before use.
- Ropes should be hung on the poles or bamboos.
- Permanent knots in a rope should be avoided as it reduces the strength of the rope.
- Ropes should not be brought in contact with any chemicals or materials containing chemicals or strong alkali.
- Dragging the rope along the ground should be avoided.
- The rope end should always be properly whipped.
- Examine the rope for fraying, chafing and break each time before use.

EMERGENCY RELIEF CAMP ORGANISATION

The displaced victims have to be temporarily sheltered and provided with food. Thus, in other words there is a need to organise relief camps during disasters.

This chapter on Relief Camp Organisation deals with details of transportation of victims, Need for Shelter and Supplies, Location of Relief Camps, Dry Ration vs Cooked food, Types of Emergency meal Centres, Kitchen Siting and Layout, Disposal of Kitchen waste, Food and Water Requirements, Storage of Food Possibilities of contamination, Basic Principles of Hygiene, Serving techniques including queueing etc.

Marooned People Are Brought To Safety

- They are evacuated in lorries or boats.
- Some reach the camp walking.
- Helicopters may be requisitioned depending on the intensity of the flood.



Organise Relief Camp At The Nearest and Elevated Point

- It could be a school.
- A Panchayat building.
- A Temple, a Church, a Mosque or a Cyclone shelter
- Tents are erected, if necessary.

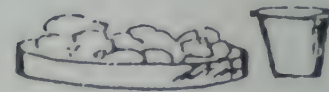


To Restore Morale: Provide Food, Water, Warm Clothing To People

- People can stay hungry only for a short while.
- Provide minimum two meals a day.
- Provide milk for children and elders.
- Dry rations or cooked food may be given. Dry rations are preferable when victims have adequate vessels.
- If dry rations are provided, then give kerosene or wood to facilitate cooking.
- This saves labour and wastage of food. .



If dry Ration is distributed, arrange for a proper requirement survey



- Stamp pads and Ink should be kept ready for obtaining receipts (Left hand Thumb Impression) from victims
- Measures and bags should be available for transfer of rations from bulk packing.
- Liquids like oil should be distributed in sachets.
- Adequate rope should be stocked to facilitate queueing.

Some pre-arrangements are necessary:

- Each family should be contacted in person.
- Family size (adults & children) should be ascertained.
- Tokens should be distributed indicating family size.

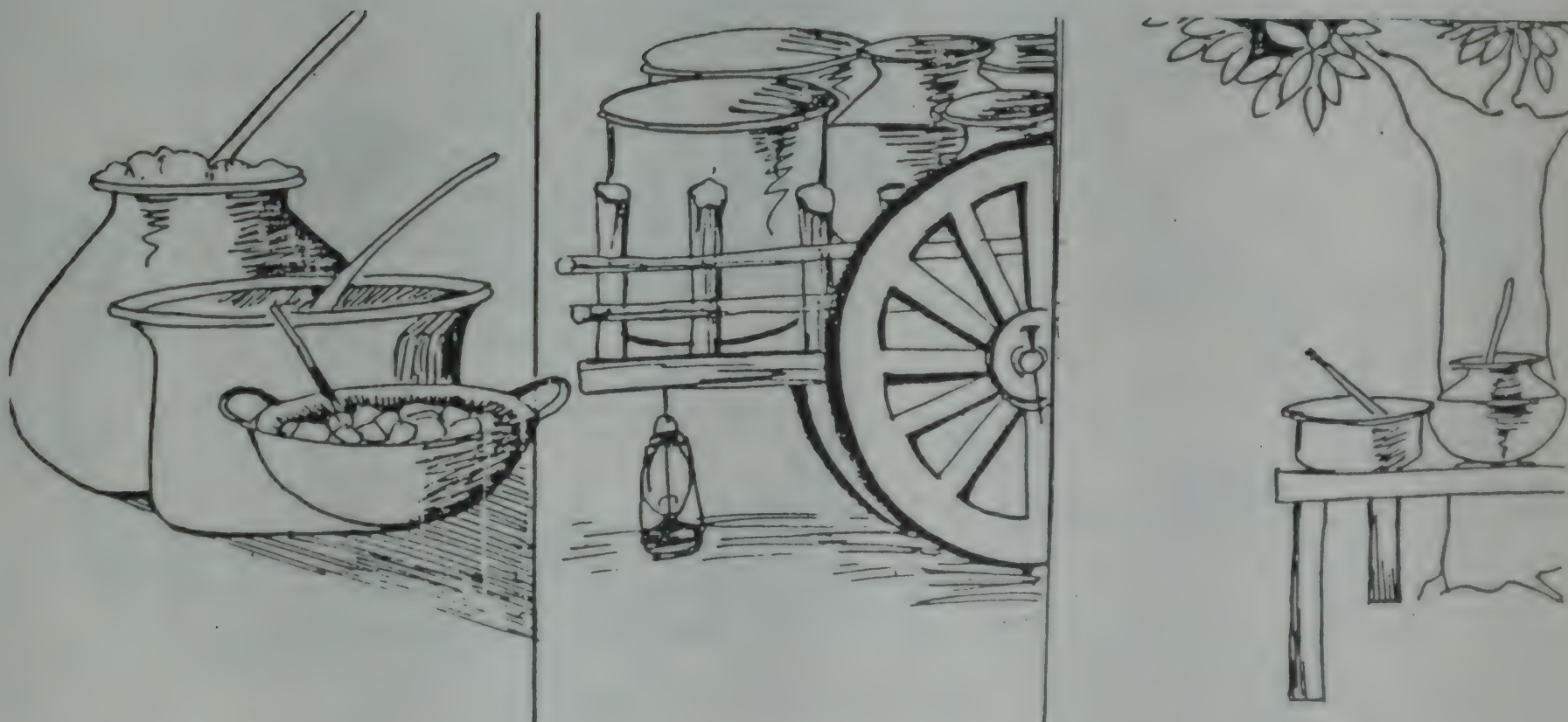
Meal Centres

Emergency meal centres supply meals to those in need, who might be local residents, evacuees or people passing through the area.

Types Of Centres

Conditions following disasters will determine the type of centre.

There are three types of centres. It could be sited indoors or outdoors.



Indoor

- Centres that prepare and cook meals for consumption at the site.
- Centres that prepare and cook meals for transport to other centres or elsewhere according to demand.
- Centres where meals are served and eaten. Meals will be transported to these centres.

Out Door

- Control the crowd by queue system.
- Erect barriers around feeding area to form an entrance to the service area.
- Provide plate if cooked food is being served.
- People may prefer to squat on the ground. Then, servers should go around with food containers.



MAKE SURE THERE IS

- One server, one job, as far as possible.
- Adequate supply of serving utensils.
- Adequate relays of food in containers for the serving table.
- Adequate space for each worker to work in.
- The queue should not get behind the serving area.

Ensure that quickness of service is maintained to avoid crowding and jostling in getting to the feeding point.

PRINCIPLES OF HYGIENE

At The Camp and Meals Centre.

Basic hygiene is a must to avoid outbreaks of diseases or food poisoning.



These outbreaks could:

- Incapacitate people for 1-5 days
- Be fatal.
- Spread Fast And lead to epidemics.
- Result In Diarrhoea, vomiting.
- Lower the Morale of the people in general.

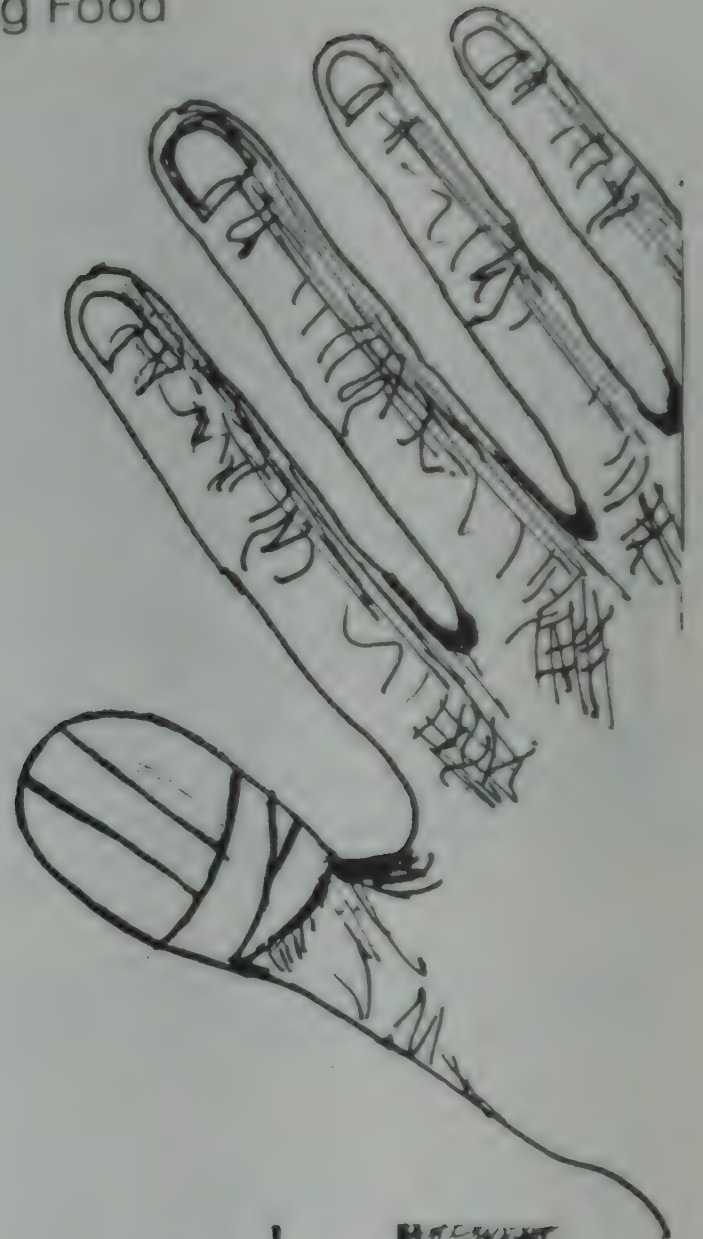
Do's And Don'ts Of Storing Food



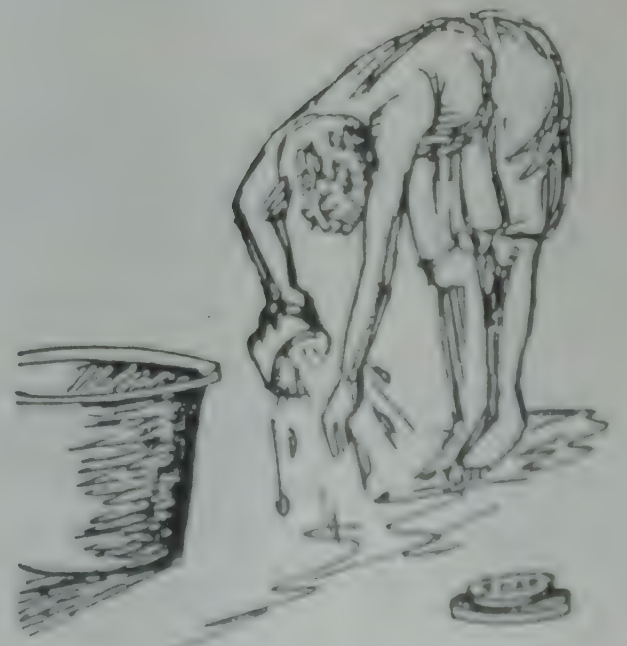
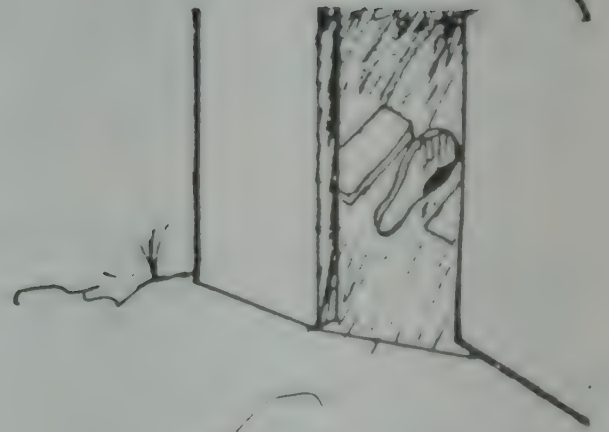
- Store food in dry and clean areas.
- Keep the cooked food well closed.
- Do not store vegetables, pulses (dhals) and rice in a dirty place.
- DO NOT store food in unclean vessels.
- Check the food frequently for fungus.
- Do not store stale food.
- Rodents, insects, animals can contaminate food.
- Storing place should be away from latrines.



Do's and Don'ts Of Handling Food



- Personal hygiene is very necessary for staff.
- No one should handle food with unclean hands.
- Do not touch food unnecessarily.
- Do not use fingers to taste the food.
- Scrub nails and fingers after visiting lavatories.
- Staff suffering from skin diseases should be withdrawn from duty.
- Any cut, sore, scratches should be attended to at once.



Use Clean Vessels



- Rough, scrape and remove all deposits into a waste tin.
- Wash vessels in very hot water with soap or detergent or any grease remover.
- Large vessels (hundas) should be steamed or boiled when they are full of water.
- When empty, stock them upside down on a clean surface.
- DO NOT DRY VESSELS with cloths. A used cloth contains hundreds of bacteria.
- If cloth has to be used, then boil the cloth once a day.
- Do not use tin or galvanised containers for preparation of sambars, dhals or any moist food, as acids or saline liquids are corrosive to zinc.
- Avoid preparation of tea in a galvanized vessel.
- Wash waste bin atleast once a day.

Kitchen Siting

The emergency kitchen may have to be set up on a site that is not in all ways suitable but when any choice is possible the following points should be borne in mind -

- The size of the site must be big enough to accommodate the required number of stoves and other pieces of equipments with adequate working space between them
- Water supplies , both for drinking and cleaning , should be as near as possible.
- Good drainage is essential for disposal of dirty water.
- The ground should be level, flat and hard. A field with short grass is quite good. Gravel or ash surface is preferable but avoid ground which is dusty when dry, and clay or marshy surface.
- The direction of the prevailing wind will determine the siting of stores, serveries feeding areas, food-preparation spaces, stoves, waste disposal areas and latrines in relation to each other.
- The site should be adjacent to the feeding area and to the suitable road for delivery of food, fuel and possibly water and for the despatch of cooked meals.
- To avoid smoke in working spaces and loss of drought in the fires, the stoves should not be overhung by trees, or placed near high walls.
- There should be some shelter for the staff.
- Avoid siting the kitchen where a main road has to be crossed to get the dining area.
- Food stores, food preparation, spaces and the serveries should be upwind from the stoves.
- Waste disposal bins and foul water soak waste should be down wind from the stoves.
- Place the incinerator and latrines for kitchen staff further down wind. The latrines should not be nearer than 100 yards.
- Facilities for hand washing should be set up in the kitchen by the entrance from the latrines.
- Boilers and washing of equipments should be nearer to the water supply, and if possible the washing up unit should be built to empty into a drain or ditch.
- Take advantages of any overhead cover or improvise it for the comfort of the staff. Cover is also desirable for food, water, food preparation, food service, cooking, fuel, washing up and latrines in that order.
- Storage of food, fuel and water should be as close as possible to the roadway so that heavy loads can be brought close to the kitchen to avoid manhandling.
- The washing up unit and grease trap must be large enough for their purposes, and the soakway big enough to deal with the water to be disposed of during atleast a whole day.

Kitchen Layout

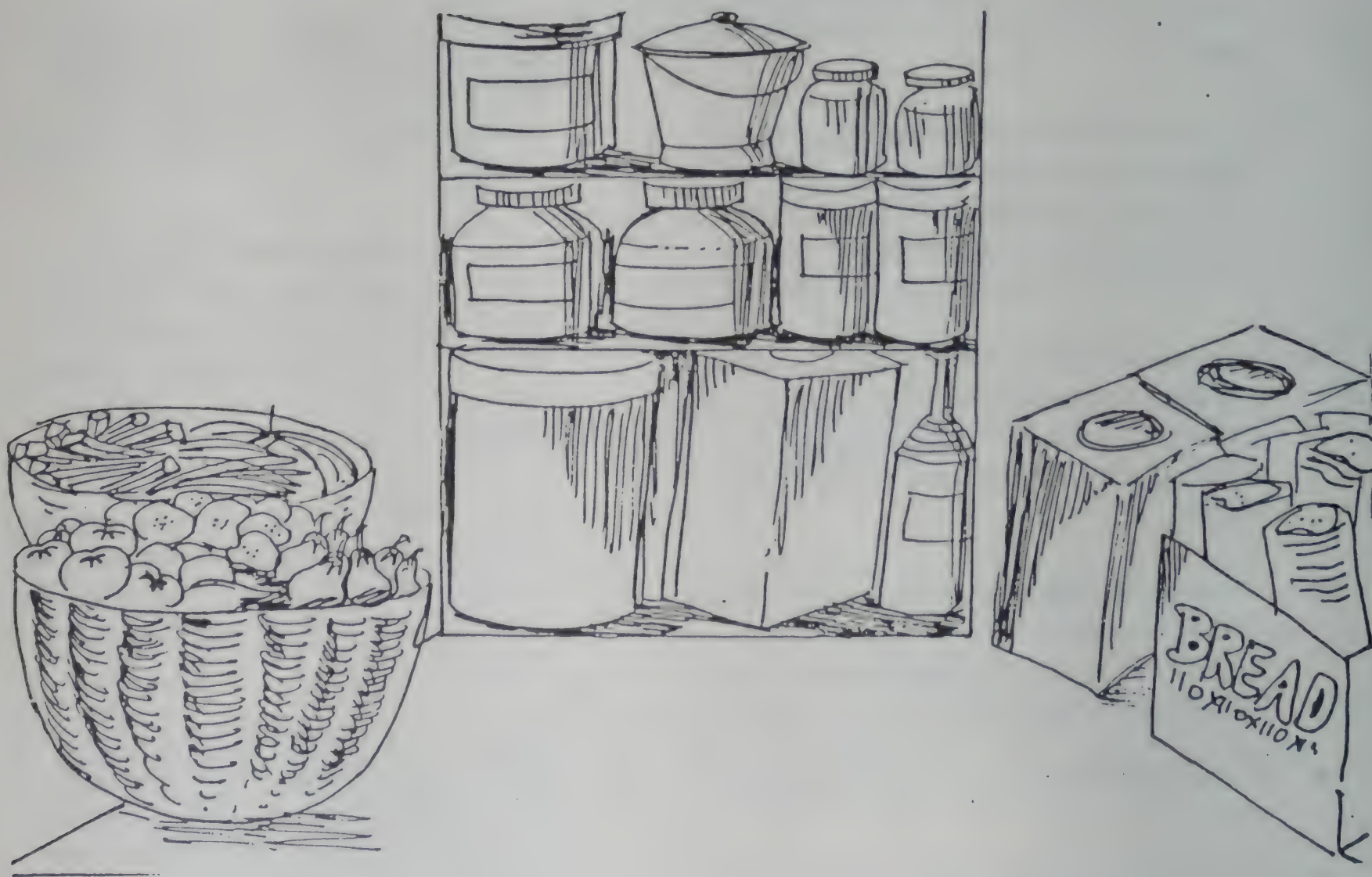
Food preparation section may be divided into 3 sub-sectors.

1. Vegetable preparation.

2. General.

3. Bakery.

This would be useful in distribution of staff to the best advantage.



Preparation and Cooking

- Organise carefully to avoid loss of time.
- Ensure that meals are ready when required.

REMEMBER

- To organise food and fuel supplies.
Allow time for preparation.
- Food, time available for cooking and the number of people to be fed will determine the type of meals.
- All members of the team should know the time the food is to be served.
- Conserve the supplies. If necessary reduce portions to bare minimum.
- Light the fire well in advance before the cooking is due to begin.
- Where possible, call volunteers to help in vegetable preparation which perhaps is the lengthiest task.

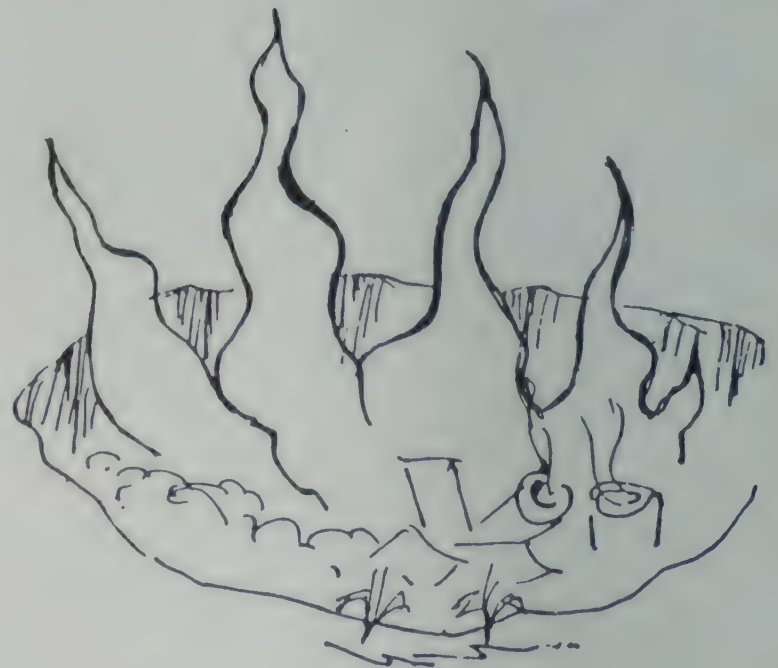
Disposal Of Kitchen Waste

During disasters, disposal of waste should be done with great care. Kitchen waste can be classified as -

- Burnable solids.
- Liquids.
- Unburnable solids.
- Food wrappers, cardboard containers, tea leaves, coffee powder which are not reused should be burnt or collected.

Burnable solids include fats, bones, vegetable material, scraps of food etc.

- Liquid waste usually contains oil.
- If thrown on the ground, a layer will form and the ground will remain dirty.
- Rats, vermin, insects will be attracted by this smell.
- If possible, remove oil before allowing the fluid to percolate into the soil.
- Dig soakage pits.
- Cover pits with wooden planks or dry leaves.
- Keep only one side opening.
- When not in use, keep the pit closed.



HOW MUCH FOOD?

Calorie Requirement

Age Group	Per Capital Daily Calorie Requirement	% of Population
0-15	1500	40
15-45	2300	45
45+	1800	15

Average calorie requirement per person per day in a mixed age group = 1800.

Calculating the actual food (cereal) required number of people = n.

Calories required for n people per day = $1800 \times n$.

3.5 calories are obtained from 1gm of cereal.

$1800 \times n$ calories obtained from 1gm of cereal.

$$\frac{1 \times 1800 \times n}{3.5} \text{ gms.}$$

$$\frac{1 \times 1800 \times n}{3.5 \times 1000} \text{ Kgs.}$$

$$\frac{1800 \times n}{3.5 \times 1000 \times 100} \text{ quintals.}$$

$$\frac{1800 \times n}{3.5 \times 1000 \times 100 \times 10} \text{ tonnes}$$

Survival Ration

Cereals	250 gms	
Pulses	50 gms.	
Dried skimmed milk -	15 gms. =	calories 1200
fat	15 gms.	proteins 38 gms
Sugar	15 gms.	

This should gradually be increased to -

Cereals	300 gms.	
Pulses	50 gms. =	Calories 1500
Oil	20 gms	Protein 48 gms.
Sugar	20 gms	

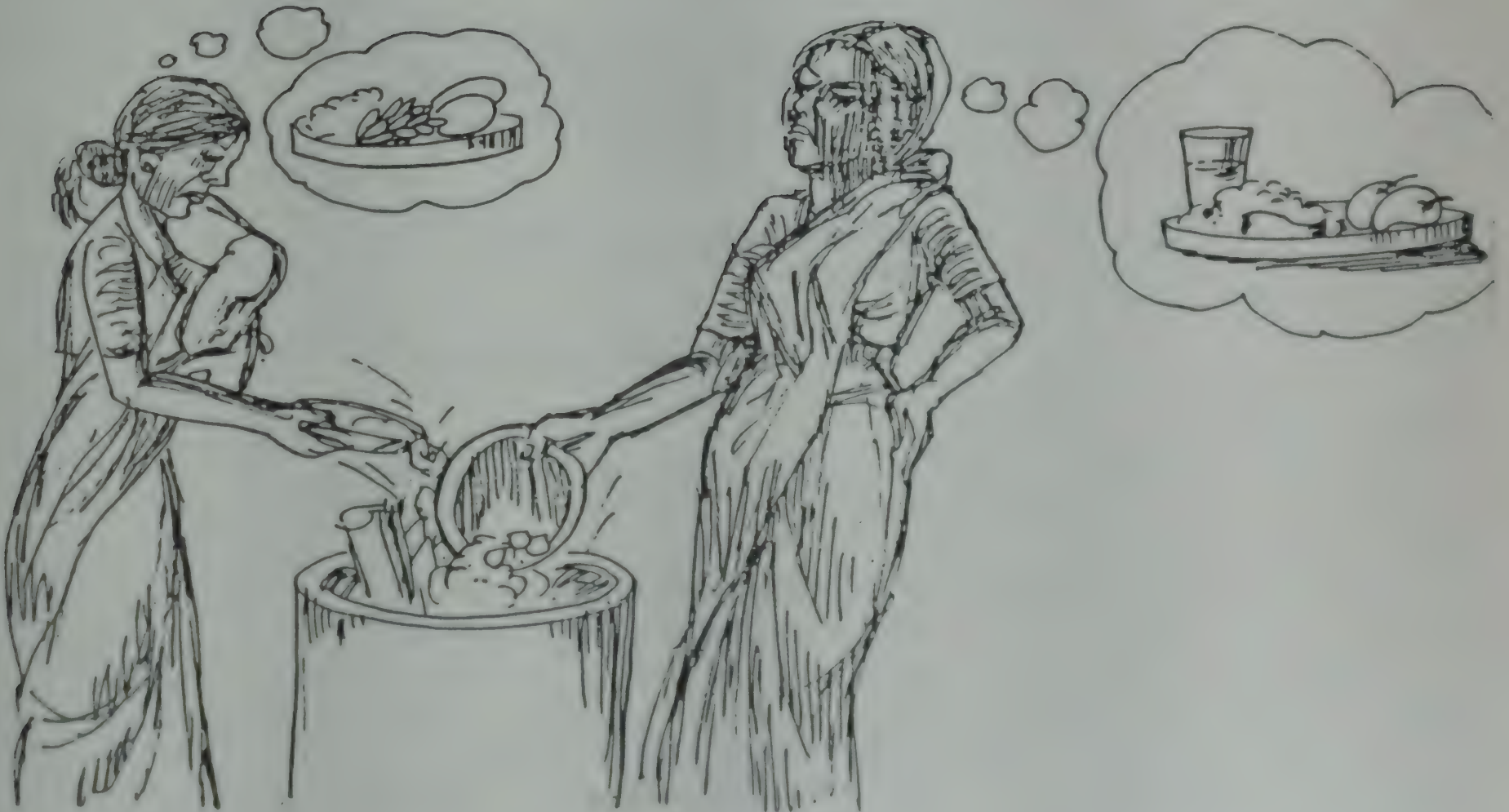
EXAMINE LOCAL STOCKS OF FOOD SUPPLY.

ASK.....

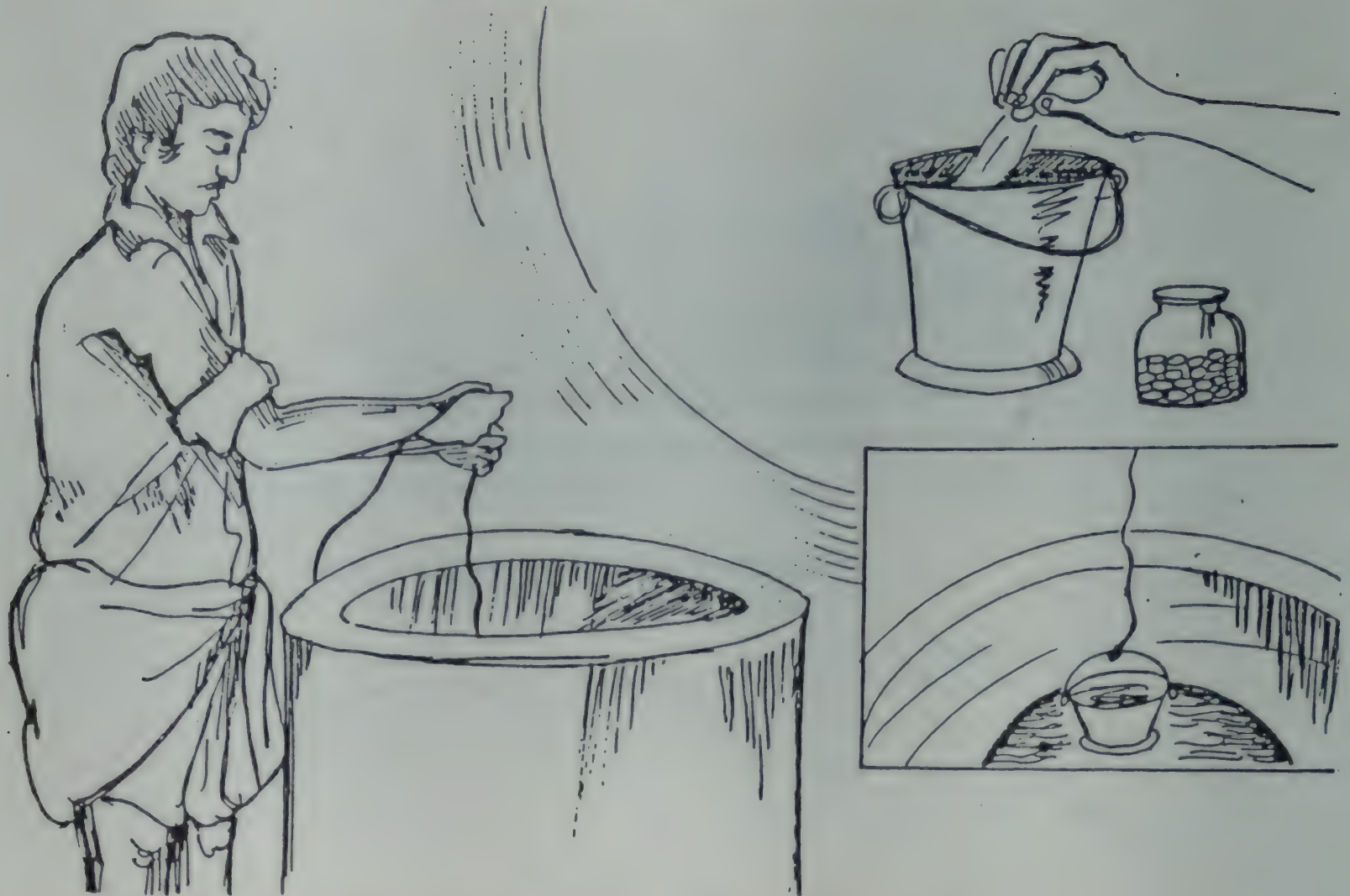
- Have household stocks or food been destroyed?
- Will traders and small shop owners co-operate in selling stocks?
- Is there any hoarding tendency?
- Are basic staple food like rice, wheat, chilli powder, salt, fish available?
- Are people having purchasing power?
- Are there enough of utensils available?

Food Requirements

- Adhere to local food habits.
- Find out about the traditional taboos, garlic may not be appreciated by some vegetarian communities. Pork is not acceptable to certain religious groups.
- Pregnant women or lactating mothers have their own likes and dislikes.
- Nutritious healthy food will be thrown away or not consumed, if not culturally accepted.



DRINKING WATER



- Use chlorine tablets or bleaching powder for purifying.
- Chlorinate all available water, even for washing and cleaning purposes, so that no secondary infection from using raw water takes place.
- Store all drinking water in drums, tankers.
- 0.5mg. Chlorine tablet for 20 litres of water.
- 2.5 gm per 1000 litres (1 hour contact time).
- Pinch of bleaching powder for individual containers like pots and jerry cans.
- If water is very turbid or contains suspended matter, use alum. This will clear the water.
- Boil water for children.

EMERGENCY MEDICAL CARE

Natural disasters often increase morbidity and mortality rates. Regular channel of communication and life support services like medical facilities are jeopardised in the event of a disaster. People suffer from mental shock. Panic and confusion prevails. A prompt response must provide first aid and organise a tiered system of care to victims before they are moved to hospitals.

Emergency medical care is and should be an integral part of the overall Disaster Preparedness plan. The programme has as its primary objective the treatment of the wounded in the immediate aftermath of a cyclone and flood in order to reduce the number of deaths and disabilities and bring about recovery.

Focus, in the following pages, is on how to identify patients using tag system, treatment of shock, pressure points to stop bleeding, use of bandages and splints to deal with fractures and methods of resuscitation. With simple and easy-to-implement measures, the manual is useful for training personnel in the disaster prone areas.

HEALTH PROBLEM COMMON TO ALL DISASTERS

- Social reactions : Panic, stunned waiting, reluctance to obey order
- Communicable disease : Contamination of food and water, disruption of services, vector borne diseases, poisonings
- Population displacement : Increased morbidity, mortality
- Climatic exposure
- Food and Nutrition : Damage to food stock, disruption of distribution system
- Mental health

SHORT TERM EFFECTS OF MAJOR NATURAL DISASTERS

EFFECT	FLOODS	TIDAL WAVE FLASH FLOODS	HIGH WINDS	EARTH QUAKE
Death	Few	Many	Few	Many
Severe Injuries	Few	Few	Moderate	overwhelming
Increased risk of communicable diseases	Potential risk rising with overcrowding & deteriorating sanitation			
Food Scarcity	Common	Common	Rare	Rare
Major Population Movement	Common	Common	Rare	Rare

Be clear about

- Who is affected? How many? Where?
- What are the present needs?
- What would be the future needs?
- What would aggravate the problem?

01980

DM-120

IDENTIFYING PERSONS WITH HIGHEST NEED

The principle of triage (sorting of patients)

Classifying the injured on the basis of the benefit they can expect from medical care and not according to the severity of injuries.

i.e. If simple intensive care would dramatically increase the chance of saving a person, s/he gets the top priority over a dying person who needs many resources.

Three categories: ✓

- Those who cannot benefit from the treatment available at that time
- The seriously injured who should be first attended to.
- Patients who can move about - whose injuries are less severe
- This classification should be done at
 - Disaster site
 - Hospital admission

TAGGING

All patients must be identified with tags stating name, place of origin, initial treatment, age, triage category, sex, diagnosis

Yellow tag template. Top section: Ambulance icon, first aid icon, and a dashed line with 'A' at the ends. Below these are four horizontal lines for text, each preceded by an icon: a house, two people, a factory, and a car. Bottom section: A black bar with a white cross, followed by three rows. Each row has a Roman numeral (I, II, III), an icon (a person, a person with a bandage, and a person with a bandage and a cross), and a line for text preceded by 'A'.

Yellow

Black tag template. Top section: Ambulance icon, first aid icon, and a dashed line with 'R' at the ends. Below these are two human figures. Bottom section: A black bar with a white cross, followed by three rows. Each row has a Roman numeral (I, II, III), an icon (a person, a person with a bandage, and a person with a bandage and a cross), and a line for text preceded by 'A'.

Black

Red

Yellow

Green

Colour of tag	Interpretation
Red	First priority for evacuation. Needs immediate care.
Green	Second priority for evacuation. Needs care but injuries are not life threatening.
Yellow	Third priority for evacuation. Minor lesions or fatal injuries.
Black	Dead i.e. no pulse (respiration for over 20 minutes) or Injuries for which resuscitation procedure are impossible

Red Tag

This tag signifies that the patient is a first priority for evacuation. Red-tagged patients need immediate care and fall into one of the following categories:

- Breathing problems that cannot be treated at the site.
- Cardiac arrest (witnessed).
- Appreciable loss of blood (more than a litre .)
- Loss of consciousness.
- Thoracic perforations or deep abdominal injuries .
- Certain serious fractures.
 - a) pelvis;
 - b) thorax;
 - c) fractures of cervical vertebrae;
 - d) fractures or dislocations in which no pulse could be detected below the site of the fracture or dislocation ;
 - e) severe concussion;
 - f) burns (complicated by injury to the air passages).

Green Tag:

Identifies patients that receive second priority for evacuation. Such patients need care, but their injuries are not life-threatening. They fall into the following categories:

- Second degree burns covering more than 30 per cent of the body.
- Third-degree burns covering 10 per cent of the body.
- Burns complicated by major lesions to soft tissue or minor fractures.
- Third-degree burns involving such critical areas as hands, feet, or face but with no breathing problems present.
- Moderate loss of blood (500-1,000cc).
- Dorsal lesions, with or without injury to the spinal column.
- Conscious patients with significant craniocerebral damage (serious enough to cause a subdural hematoma or mental contusion). Such patients will show one of the following signs:
 - secretion of spinal fluid through ear or nose;
 - rapid increase in systolic pressure;
 - projectile vomiting;
 - changes in respiratory frequency;
 - pulse below 60 ppm;
 - swelling or bruising beneath the eyes;
 - anisocoric pupils;
 - collapse;
 - weak or no motor response;
 - weak reaction to sensory stimulation (profound stupor).

Yellow Tag:

Used on patients who are given third priority for evacuation and who fall into the following categories:

Minor Lesions

- Minor fractures(fingers, teeth, etc.)
- Other minor lesions, abrasions, contusions

Minor burns:

- second-degree burns covering less than 15 per cent of the body;
- third-degree burns covering less than 2 per cent of the body surface;
- first degree burns covering less than 20 per cent of the body, excluding hands, feet, and face.

Fatal Injuries

- Second and third-degree burns over more than 40 per cent of the body, with death seeming reasonably certain.
- Second and third-degree burns over more than 40 per cent of the body, with other major lesions, as well as major fractures, major craniocerebral lesions, thoracic lesions, etc.
- Craniel lesions with brain tissue exposed and the patient unconscious;
- Craniocerebral lesions where the patient is unconscious and has major fractures.
- Lesions of the spinal column with absence of sensitivity and movement.
- Patient over 60 years old with major lesions.

Black Tag:

Black tags are placed on the dead, i.e. casualties without a pulse or respiration who have remained in that condition over 20 minutes or whose injuries render resuscitation procedures impossible.

INJURIES

TYPES:

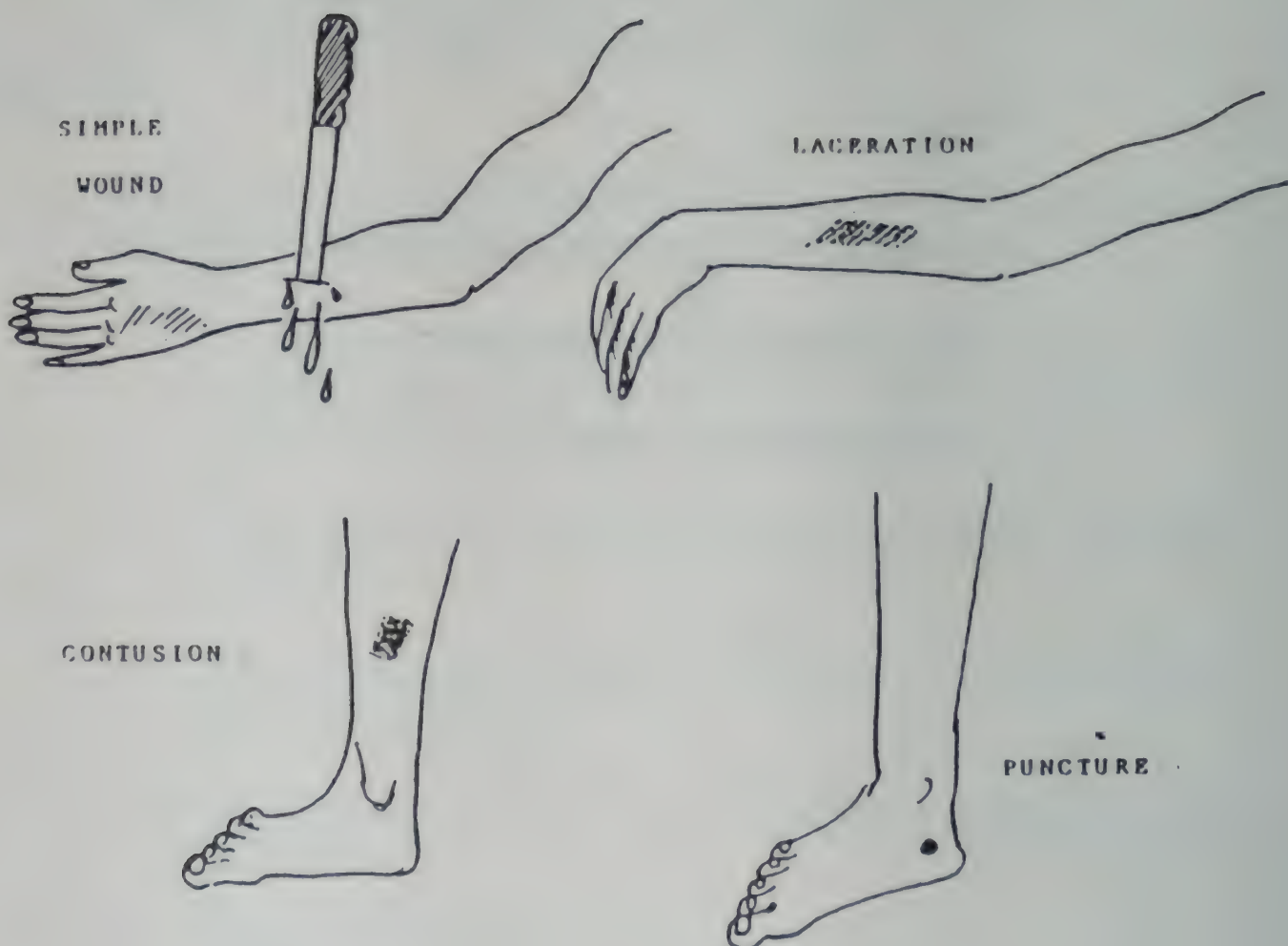
- 1 . External Injuries: Wound, laceration, contusion.
- 2 . Damage to internal organs.
- 3 . Fracture/dislocation.

External Injuries

A simple injury caused by an object (eg) Knife cut. If this has jagged ends it is a laceration.

When an object falls on the body causing only internal haemorrhage seen as bluish discolouration of the skin, it is a contusion.

- Wounds cause bleeding and infection. They could also damage internal organs.



Internal Injuries

This is not easy to make out.

Pain may be severe. A conscious person may be able to pinpoint the area of pain.

Head, chest or abdominal injuries are frequently associated with internal damage.

Shock results if a person has internal bleeding. This can be made out by a rapid pulse (normal 72 - 80 mt), cold clammy skin, shallow breathing and blurred vision.

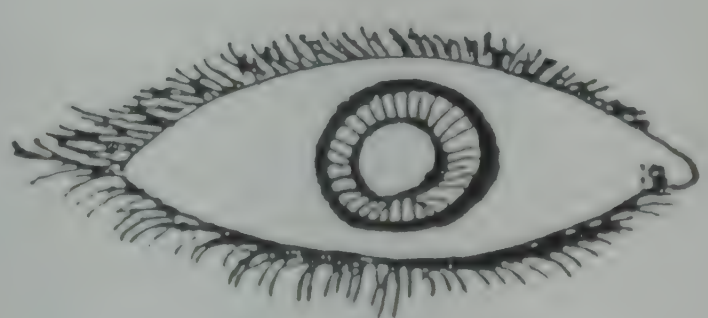
Fresh blood in the vomitus, urine or motion or tar coloured vomitus or motion indicate internal bleeding.

Swelling, hardness and pain on touch indicate internal injury.

Brain injury results in unconsciousness, fits or stupor. The pupils may not react in normal way to light.



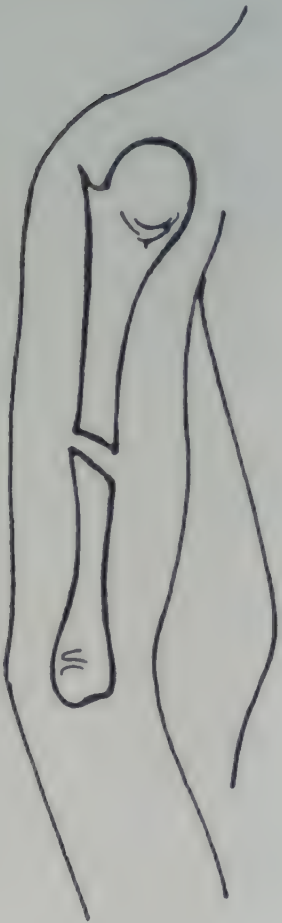
NORMAL REACTION



DILATED PUPIL

FRACTURES

SIMPLE FRACTURE



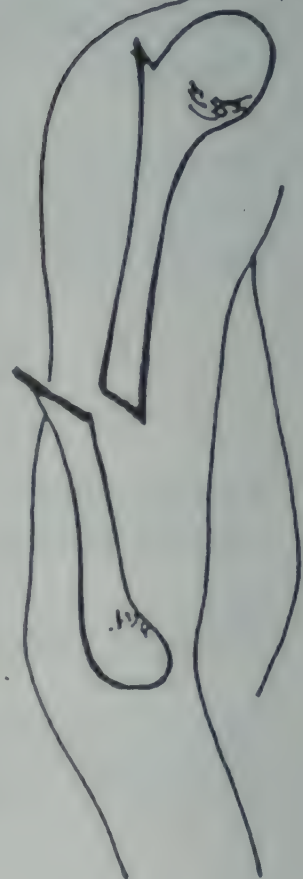
Fracture is a word used to describe a break in the bone. It could be:

Simple - If no wound is present over the area of fracture, leading to

Compound - a wound directly leads to the fracture

Complicated - accompanies an internal injury.

COMPOUND FRACTURE



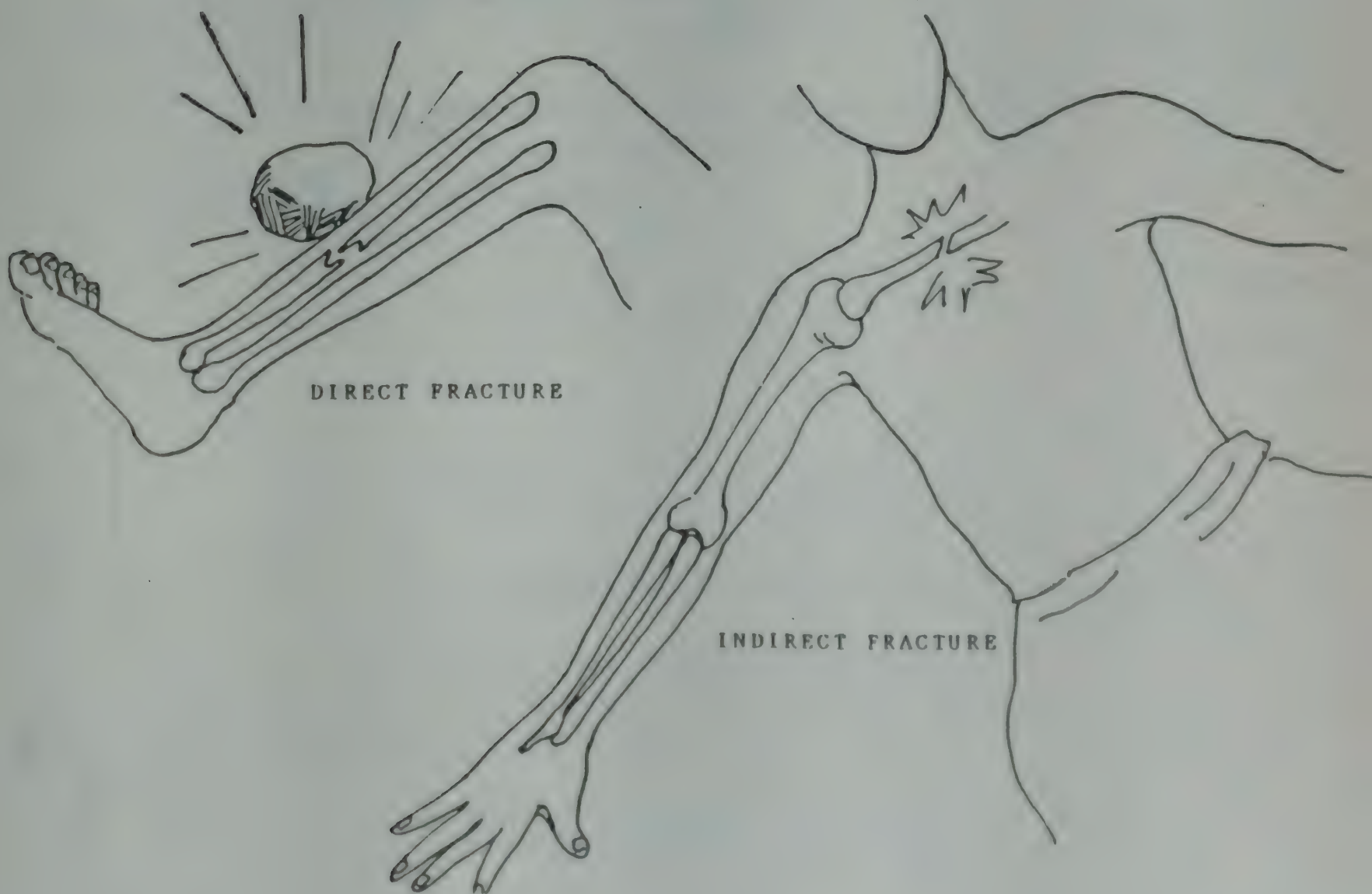
It is best to treat fractures on the spot - only if you are experienced and trained. If not, immobilise the fracture and seek medical attention immediately.

Direct Fracture

if the bone breaks at the points of external injury

Indirect Fracture

The bone breaks at a point away from the point of external injury.



Identification of fracture

- Pain over the bone or joint.
- Abnormal Shape/deformity or movement of the overlying part..
- The person heard or felt a 'Snap' .
- Swelling.
- Grating sound or feeling.
- Numbness, loss of pulse, or twigling in the affected area.
- Always compare the suspected area with the other half.

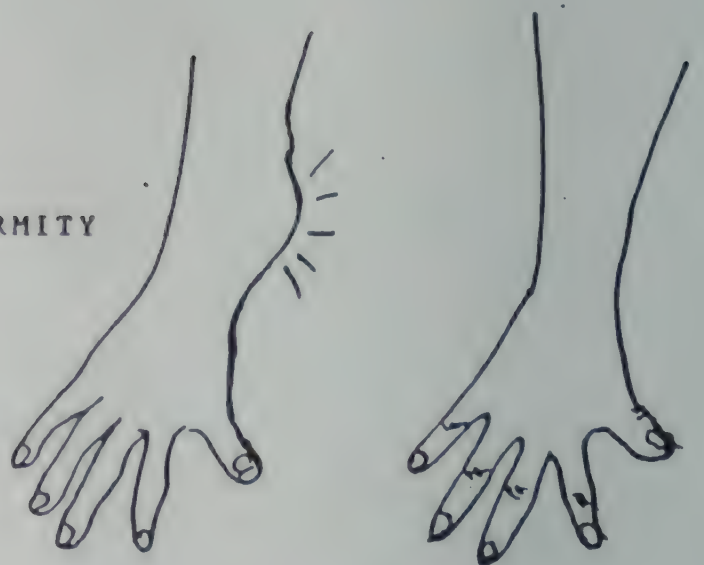
ABNORMAL
MOVEMENT



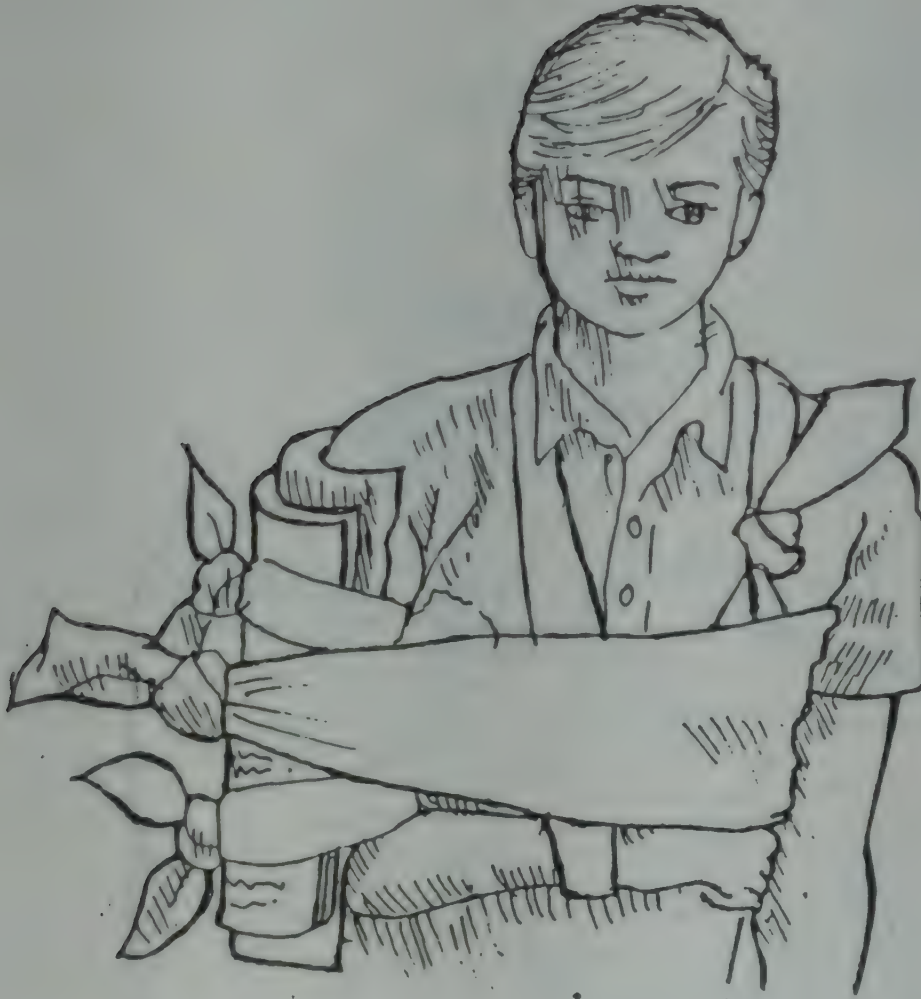
SWELLING



DEFORMITY



Immobilisation



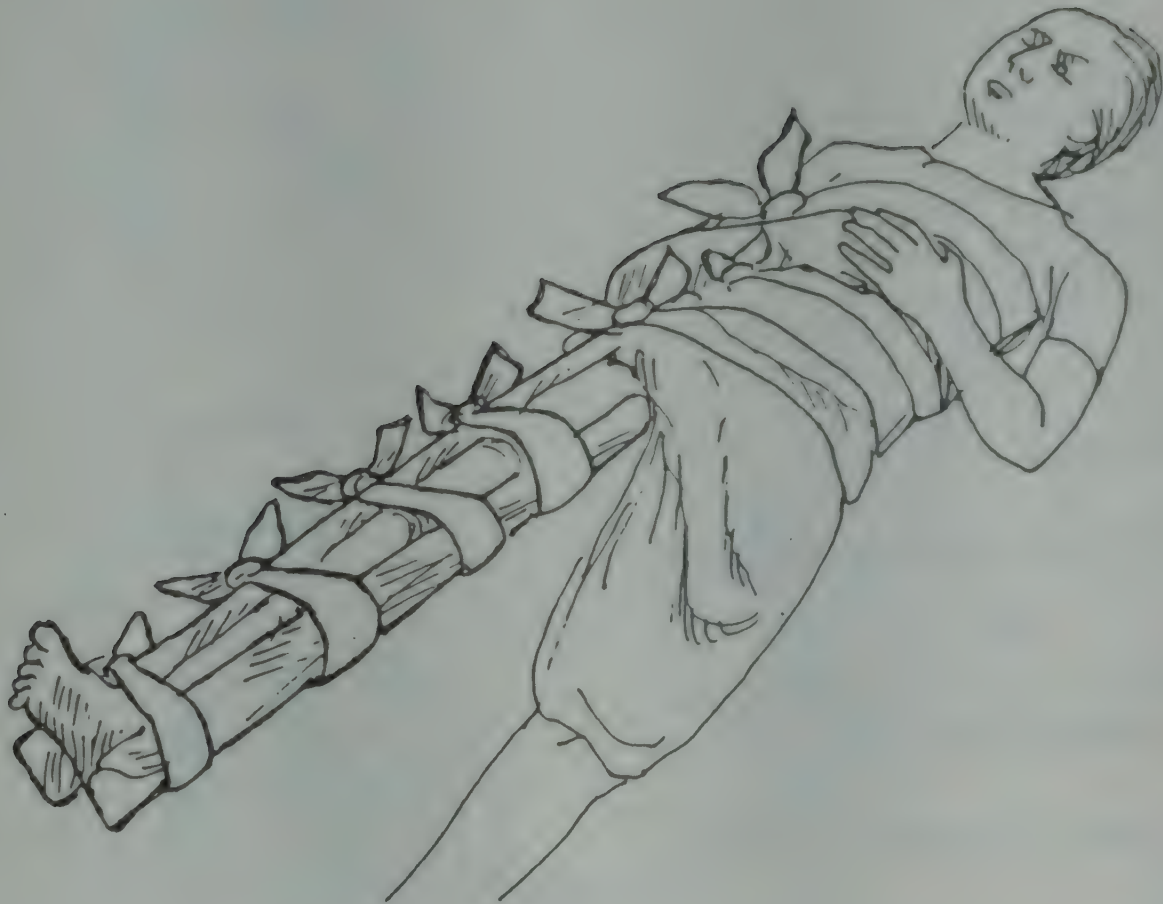
- Do not move the affected area if possible, or keep at an absolute minimum.
- Do not straighten the injured part
- Use any straight object- ruler, bark of trees, pieces of timber, even folds of paper or other limb as a splint.
- Check for pulse and numbness frequently. Relax bandage if too tight.

Management



- Always check the pulse and respiration first. Control any bleeding.
- Do not move the patient before immobilising the affected part.
- Keep the skin clean and covered.
- Immobilise joint using available splint.
- For details of immobilisation see section on bandages.

Immobilisation of Leg



Immobilisation of Foot



CONTROL OF BLEEDING

Direct Pressure:

Wipe the bleeding area.

Cover the point of bleeding with a clean cloth or bare hands.

Press firmly on the entire wound for 10 minutes without releasing pressure.

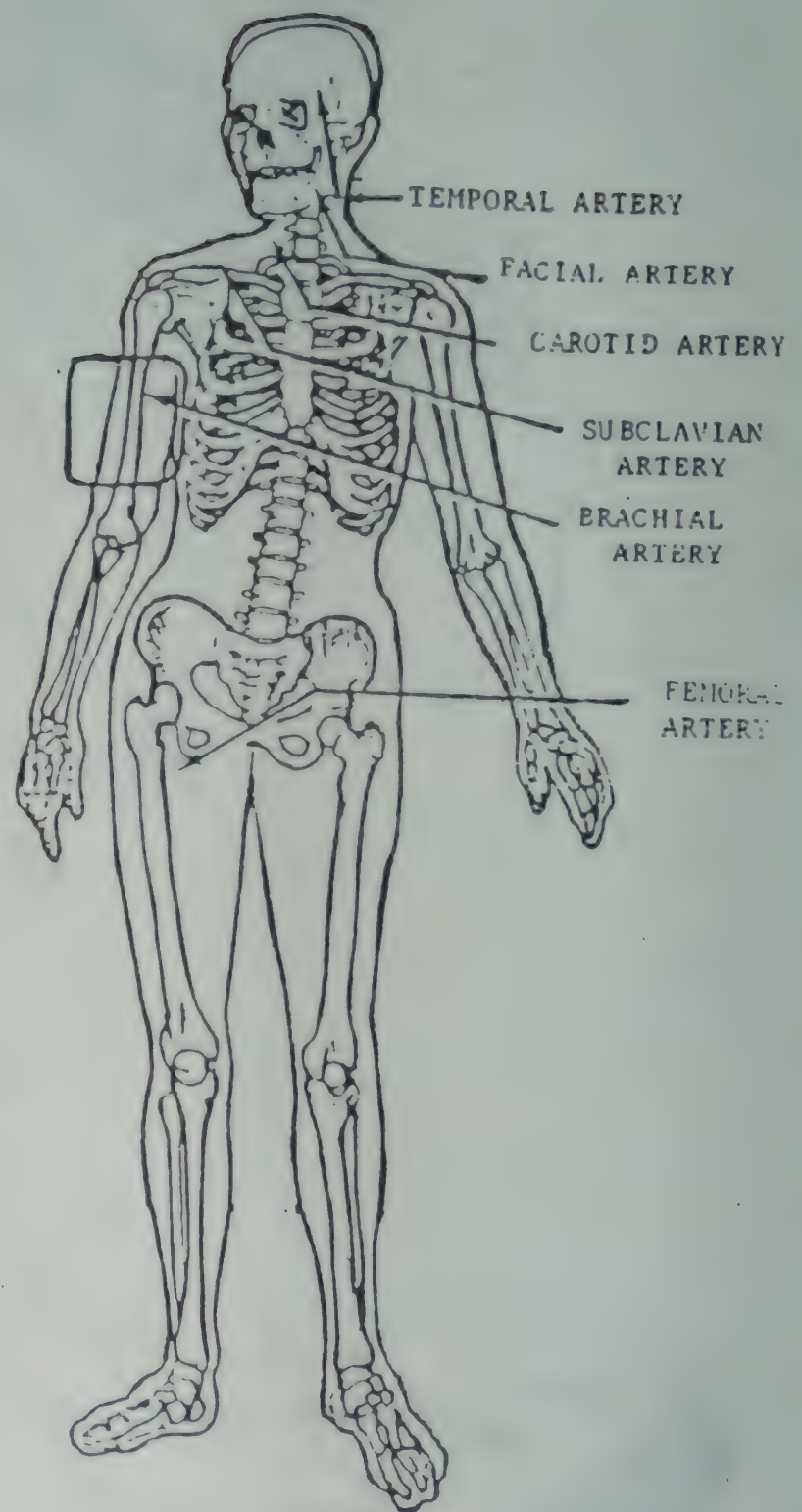
While pressing, raise the injury above the level of the heart.

When the bleeding stops, tie the cloth pad firmly.

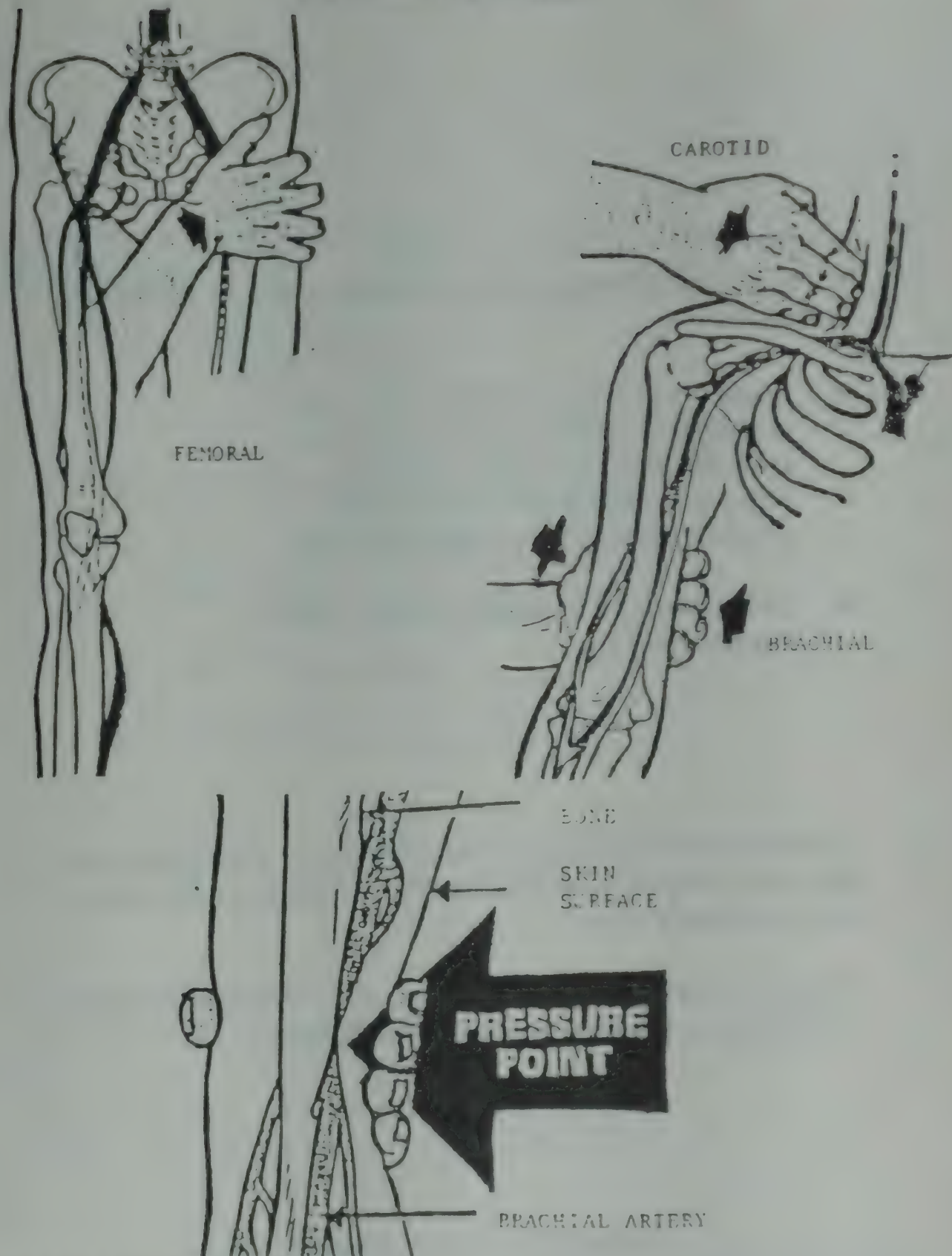
If the injury is on a limb feel for the pulse beyond the injury. If not felt, loosen the bandage.

If the bleeding does not stop, you are not pressing hard enough. Press harder.

Cold water/ice applied on the bandage will control bleeding.



Pressure Points



REMEMBER

- Do not remove embedded objects.
- Do not remove bandages if they become blood soaked.
- You may disturb the clot and bleeding will resume.
- Add another layer and press harder.
- Seek medical attention
- Do not use a tourniquet

Indirect pressure

If the wound is large and if a foreign body or fracture is suspected :

- Apply pressure for 10 minutes on what is known as pressure point as near as possible to the wound, towards the heart side, where the artery can be pressed against the underlying bone.
- Relax pressure and note whether bleeding has ceased.

As soon as the bleeding is controlled apply a bandage over this area making sure that the blood supply to the limb is not completely cut off.

If not controlled within 10 minutes, relax and reapply pressure. Repeat this until medical aid is obtained.

Bleeding From Scalp

Place a firm pad on the bleeding point and secure it by a narrow bandage with its centre laid on the pad, the ends carried round the head in the most convenient direction and tied tightly over the pad.

Internal Bleeding

If any of the following are present, the person is probably bleeding inside:

- Coughing foamy red blood.
- Vomiting with red or brown material.
- Bowel movements containing red or black tar like materials.
- Red or Brown urine.
- Remains unconscious, pale and cold.

If the person is unconscious, or vomits blood or is bleeding in or around the mouth, lay him on his side to keep his airway open.

In all other situations make him lie on his back with legs elevated about 1' above floor level.

- Do not give the person anything to eat or drink as surgery may be necessary.
- Conserve body heat by covering the person lightly.
- Seek medical assistance immediately.

SHOCK

A person is in shock if :

- he is unconscious and may be restless.
- extremities ^{are} of pale or cold.
- does not respond to stimulus.
- Pulse is weak and thready.
- The usual causes are bleeding, physical pain or painful news or event.

If shock is not treated on time it could become irreversible.

Therefore

- Reassure the casualty. Speak to him gently and keep calm. Do not appear panicky or excited. Remember what ever you say about his condition could be heard by him even if he is not conscious.
- Make him lie down and raise his feet (Unless it is a chest/head injury when head and shoulders should be kept slightly raised).
- Keep the patients still and wrap him warmly.
- Loosen all tight clothing especially around the waist and chest (like dhoties and sarees).

Check and Treat the Cause:

- If he has lost blood this has to be replaced.
- If the victim has lost fluids by way of vomiting or diarrhoea he has to be given fluids by mouth or through drip.
- If the shock is due to pain, it can be diminished only with the use of drugs.
- Hysteria can be checked by a slap on the cheek.
- Do not give anything to drink, in case he needs an operation, just give sips if necessary.
- Do not use heat or hot water bottles as this might give rise to burns, the patient being unconscious.
- Do not move the patient unnecessarily.
- If vomiting is likely or if there is interference in breathing place him, head turned sideways.

If there is excessive bleeding severe injuries, or if you suspect internal injury, or if the patient does not become conscious inspite of our efforts to revive him, remove the patient to hospital.

Do not delay

Always see that level of the head is lower than that of the body on the stretcher. Do not do this for head, chest or abdominal injuries when head and shoulder should be raised slightly even on a stretcher.

RESUSCITATION IN DROWNING

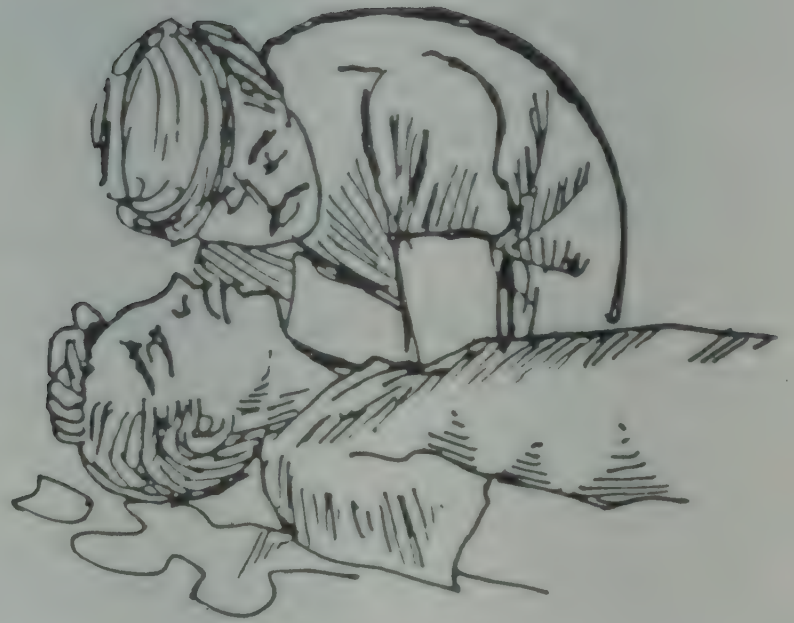


- On saving a person drowning in water immediately check for breathing and pulse.
- Before doing anything else restart breathing and pulse.
- Do not attempt to expel water from the person's lungs unless it is difficult to blow air into his lungs.
- Send for medical help urgently.

Methods Of Resuscitation

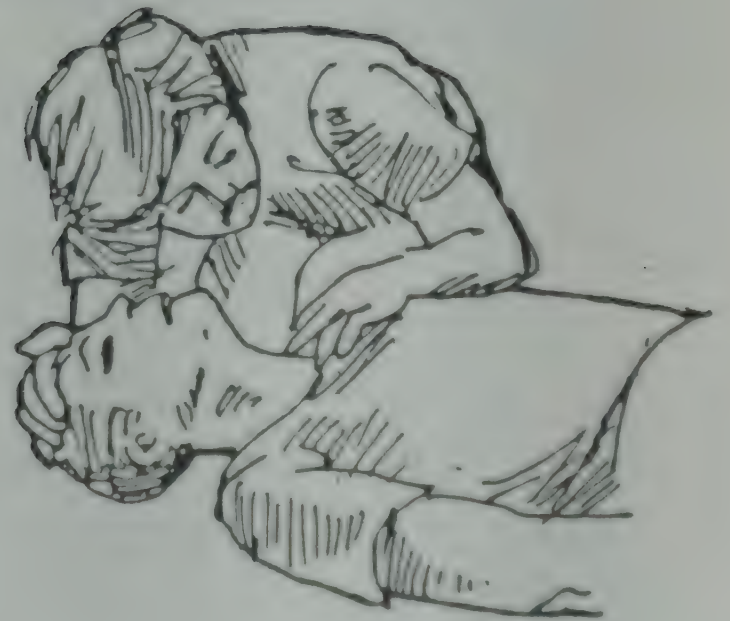
Step I

Quickly remove anything stuck in the mouth or throat.



Step II

Quickly lay the person face up tilt his head (except in neck injuries) way back and pull his jaw forward.



Step II

Pinch his nostrils closed with your fingers. Open his mouth wide, take a good breath, cover the person's mouth with yours and blow strongly into his lungs so that his chest rises. Pause to let the air come out. Inhale fresh air. Blow again.

Repeat about 15 times/minute.



CAUTION

With new born babies breathe very gently about 5 times per minute.



Check pulse and recheck breathing.

Do not give up till medical help arrive.

USES OF BANDAGE

Bandages are used to keep the dressing in position and to exert on the wound the necessary amount of pressure. They may be of calico or Tarlatan, or less frequently of cotton or Flannel. .

The usual width of bandage is from 2" to 4". It could be either rolled by hand or by roller. Adhesive bandages (Elasto-Plast) are very useful for keeping dressing in position on different parts of the body where the normal bandages are difficult to be tied . These bandages may be used when strong pressure is required temporarily. It must be used with caution and not left on long enough to arrest the circulation in the region.

The proper application of bandages is important and requires considerable practice. To discuss in detail where and which type of bandage is applied, see the following pages.

ROLLER BANDAGE



- The parts of the bandages are referred to as the head and the free end or tail.
- Usually a single roller bandage is used, but for certain parts a double headed roller bandage is required.
- In this, the free ends of two roller bandages are sewn together, leaving two heads close together on the same side of the bandages.
- usually 6 yards long, except very narrow ones, which are shorter.
- The width vary according to the part of the body to be bandaged.

PARTS BANDAGED	WIDTH
Finger	1 inch
Arm	2 - 2 1/2 inches
Leg	3 - 3 1/2 inches
Trunk	4 - 6 inches
Head	2 inches

Rules For The Application Of Roller Bandages

- Use a tightly rolled bandage of the correct width.
- Support the part to be bandaged throughout : for the forearm the hand should be prone (palm downwards).
- Always stand in front of the patient except when applying a capeline bandage.
- Bandage a limb in the position in which it is to remain.
- Hold the bandage with the head uppermost and apply the outer surface of the bandage to the part, never unrolling more than a few inches of bandage at a time.
- Bandage from within outwards, and from below upwards, maintaining even pressure throughout.
- Begin the bandage with a firm oblique turn to fix it, and allow each successive turn to cover two thirds of the previous one, with the free edges lying parallel.
- Make any reverse or crossings in a line on the outer side of the limb, except when this brings them over a wound or prominence of bone, in which case they must be on the front of the limb.
- Pad the axilla or groin when bandaging these parts so that two surfaces of skin do not touch beneath the bandage.
- Finish off with a straight turn above the part, fold in the end and fasten with a safety-pin.

Turns Used In Roller Bandage

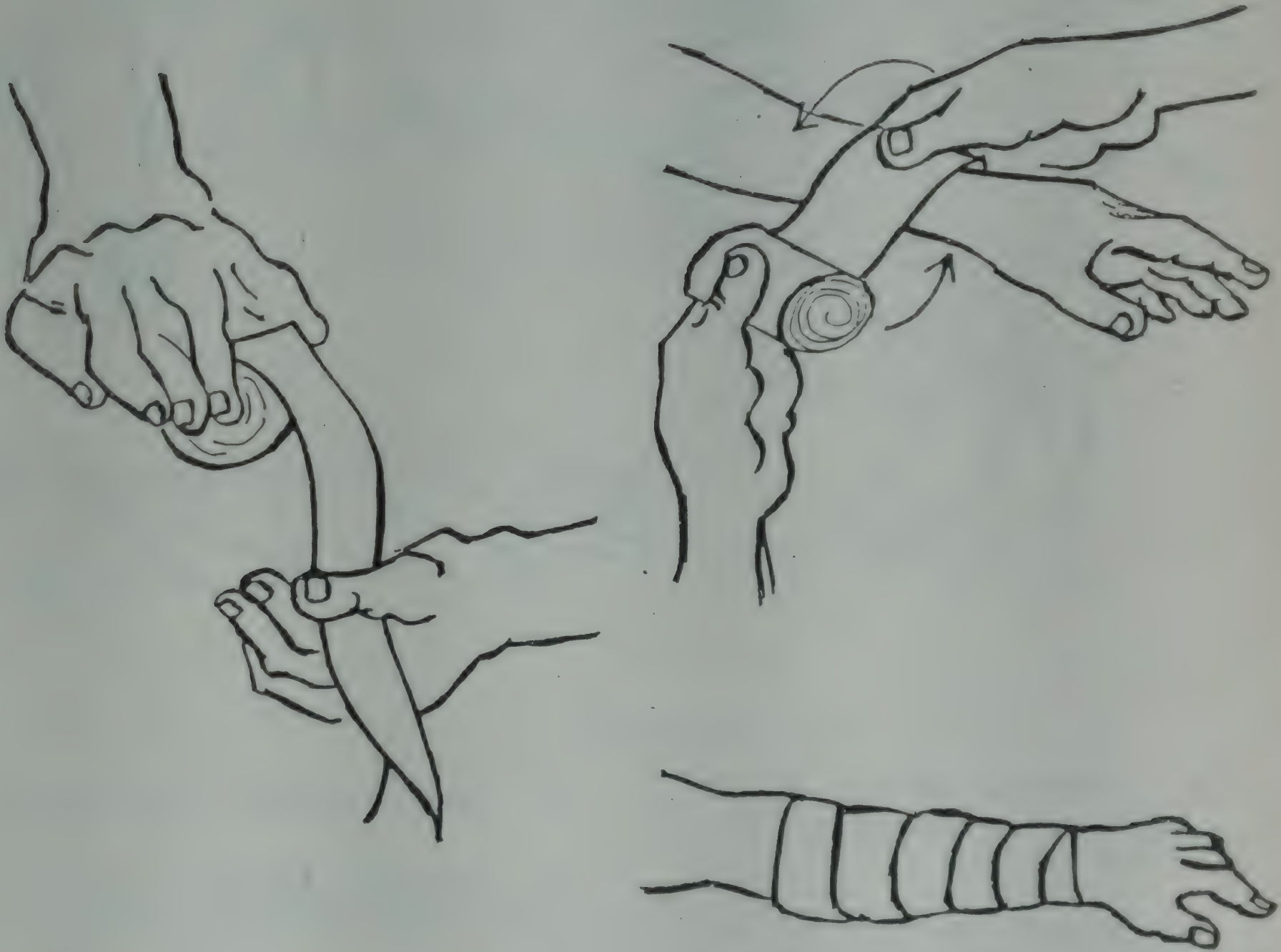
Simple Spiral

Reverse Spiral

Figure of eight

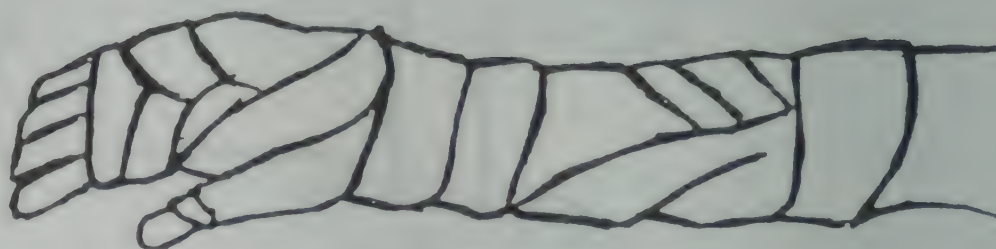
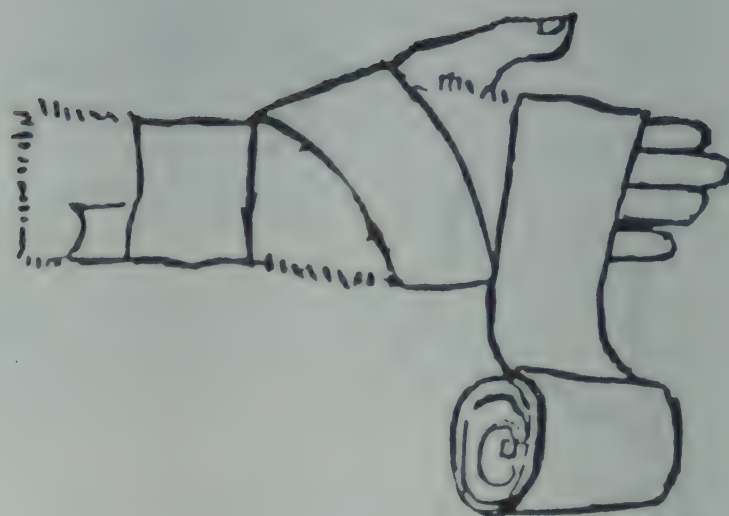
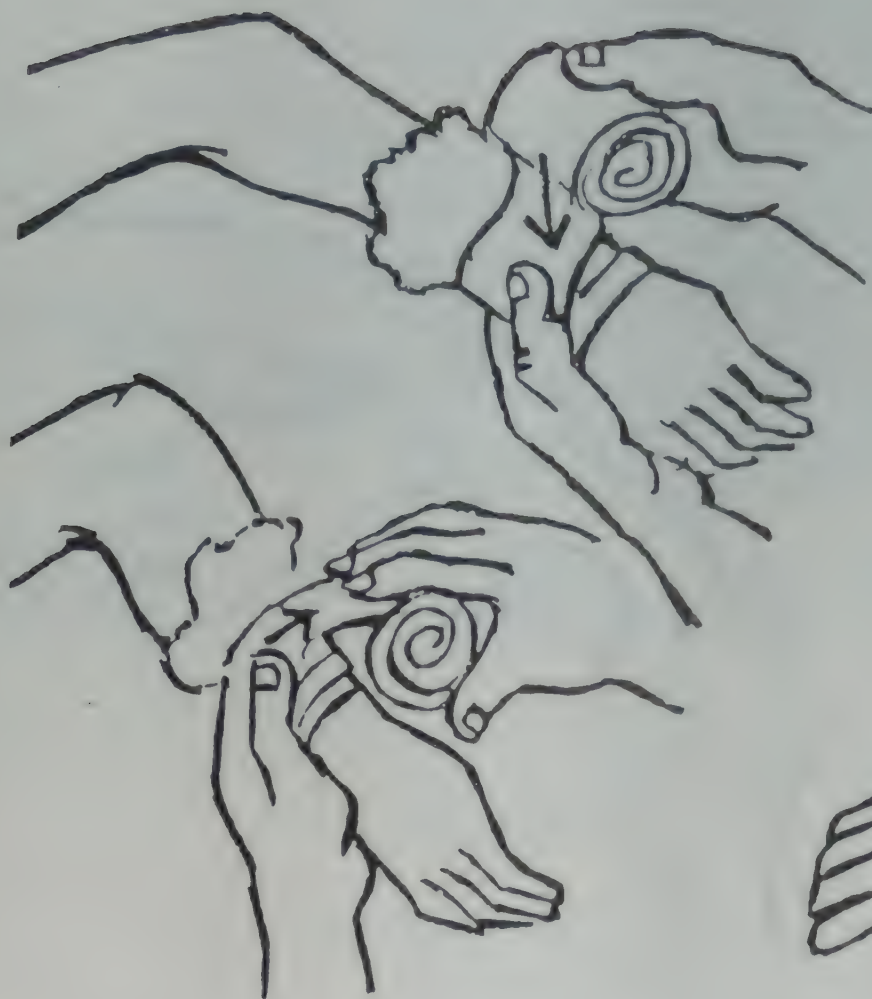
Spica

Simple Spiral Bandage



- Used in parts which are of uniform thickness, such as finger or wrist.
- Bandage is applied obliquely round the part, each turn covering two-thirds of the preceding one and the edges being kept parallel.

Reversed Spiral



- Used for parts which vary in thickness and upon which simple spiral will not lie evenly.
- One or two simple spiral turns are usually made to carry the bandage to the point at which the spiral can longer be employed.
- Fix the lower edge of the spiral with the thumb about half-way between the mid-line and outer surface of the limb.
- Reverse the bandage and bring down. Carry it round the limb. Make another reverse above the former one.
- Repeat the reverse as far as necessary.
- Complete the bandage with one or two spiral turns straight round the limb.
- See that each reverse occurs immediately above the previous one, so that the pattern is even.
- Each turn should cover two-thirds of the preceding one, as in the simple spiral.

FIGURE OF EIGHT

- Used for bandaging limbs and covering joints.
- Consists of series of loops encircling the part in the form of figure of 8.
- The upper loop is completely hidden by the successive turns and the lower loop forms the pattern.
- Each one covers two-thirds of the preceding loop and crossing in the same line.

The Spica

- is a form of the figure of 8.
- One turn is very much larger than the other.
- Used for joints at right angles to the body. Eg. Shoulder, groin, thumb.

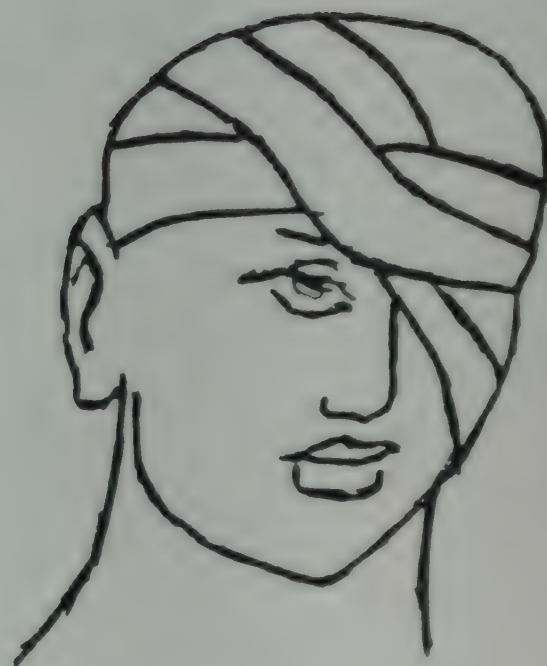
EAR BANDAGE

- Lay the outer surface of the bandage against the forehead.
- Carry the bandage round the head in one circular turn, bandaging away from the injured ear towards the sound side.
- Carry it round to the back of the head, low down in the nape of the neck and bring it up over the lower edge of the dressing to the fore-head.
- Continue across the top of the head to the nape of the neck again.
- Repeat, each turn being slightly higher than the previous one as it covers the dressing, but slightly lower as it covers the hair.
- Continue until the whole dressing is covered.
- Complete by one straight turn round the forehead.
- Pin where all the turns cross one another.



EYE BANDAGE

- Lay the outer surface of the bandage against the forehead.
- Take one circular turn round the head, bandage away from the injured eye.
- Carry it round the head until it reaches the ear on the sound side for the second time.
- Take it obliquely to the back of the head, under the prominence at the back of the skull.
- Bring it now upwards beneath the ear of the affected side, over the pad on the eye to the circular turn.
- Continue over the head to the starting point.
- Repeat two or three times until the dressing is covered.
- Finish with a safety pin just above the good eye.
- Pattern resembles ear bandage but there are fewer turns.
- The bandage should be light in weight.
- should not obstruct the view of the good eye.



FOOT AND ANKLE BANDAGE



- Take one or two turns round the ankle to fix the bandage.
- Take it obliquely across the foot to the root of the little toe.
- Make one horizontal right turn round the foot at this level.
- Carry the bandage back over the foot.
- Take a turn round the ankle just above the heel.
- Figure of 8 turns are then repeated round the foot and ankle.
- Each turn overlaps the preceding turn by two-thirds of its width, until the whole foot is covered.

LEG BANDAGE

If the bandage is to be continued up the leg, the reverse spiral or figure of 8 turns may be used, as for the arm.

- Support leg so that the heel projects well over the edge of the chair, stool or cushion on which it is placed.
- The foot should be at right angles to the leg.
- Start the bandage with a turn over the tip of the heel, so that the centre of the bandage lies immediately over the tip.
- Carry it round the foot just below the tip of the heel so that the margin of the bandage covering the tip of the heel is well covered.
- Bring it over the ankle, take round the leg just above the tip of the heel, so that the other margin of the bandage covering the tip of the heel is also covered.
- Repeat turns. Each turn is made just below and above the preceding one, until the heel is well covered.
- The bandage extends from half-way along the foot to well above the ankle.

LOWER LIMB



KNEE



SPICA OF HIP



HEEL



ELBOW BANDAGE



- Bend the elbow at right angles.
- Lay the outer side of the bandage on the inner side of the joint.
- Take one straight turn.
- Carry the bandage over the elbow tip and round the limb at the elbow level.
- Make second turn to encircle the fore arm and the third arm.
- Each turn must cover the margin of the first turn.
- Continue the turns alternately below and above the first turn, allowing each to cover $\frac{2}{3}$ of the previous turn.
- Finish above the elbow.



FINGER BANDAGE

- Hand pronated, bent with palm down.
- Fix the bandage by two circular turns round the wrist.
- Leave the end free for tying off afterwards.
- Carry the bandage obliquely over the back of the hand to the base of the finger to be bandaged.
- Taking the fingers in order, start from the little finger.
- Take one spiral turn to the base of the finger - nail.
- Cover the finger with simple spiral turns.
- Carry the bandage across the back of the hand to the wrist.
- Complete it with one straight turn round the wrist.
- Secure by a safety pin or by tying two ends together.
- If more than one finger is to be bandaged, take a turn round the wrist, between each two fingers.
- Continue as above.



SPICA OF THUMB BANDAGE



- Hold the hand downwards, so that the back of the thumb is uppermost.
- Take two turns round the wrist.
- Carry the bandages over the back of the thumb.
- Encircle the thumb with one or two straight turns, so that the lower border of the bandage is level with the root of the nail.
- Carry the bandage back over the back of the hand, round the wrist.
- Repeat with the figure of 8 turns round the thumb and wrist, until the thumb is completely covered.
- Complete it with one straight turn round the wrist.

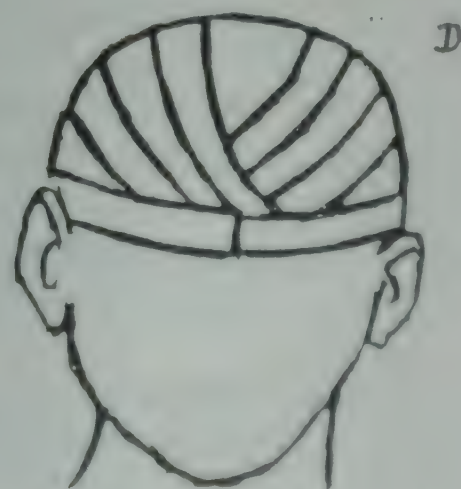
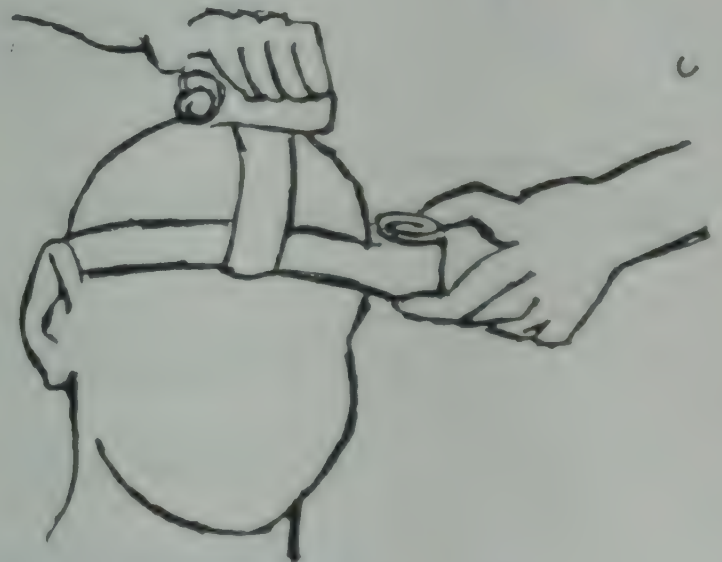
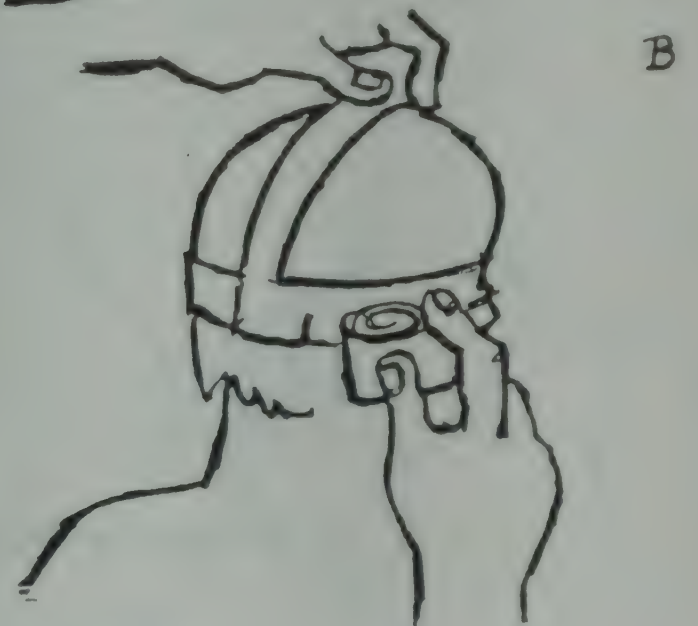
SPICA OF SHOULDER BANDAGE

- Place small pad of cotton-wool in each armpit.
- Take a 3/4 inch bandage.
- Fix it with two spiral turns round the upper part of the arm.
- Make two or three reverse spiral turns round the upper arm until the bandage reaches the point of the shoulder.
- Carry the bandage over the shoulder, across the back and under the opposite armpit.
- Bring it back across the chest and arm, round under the armpit and above the shoulder again, covering 2/3 of the previous turn.
- This forms a figure of 8 round the arm and the body.
- Repeat until whole shoulder is covered.
- Secure with a pin over the injured shoulder.



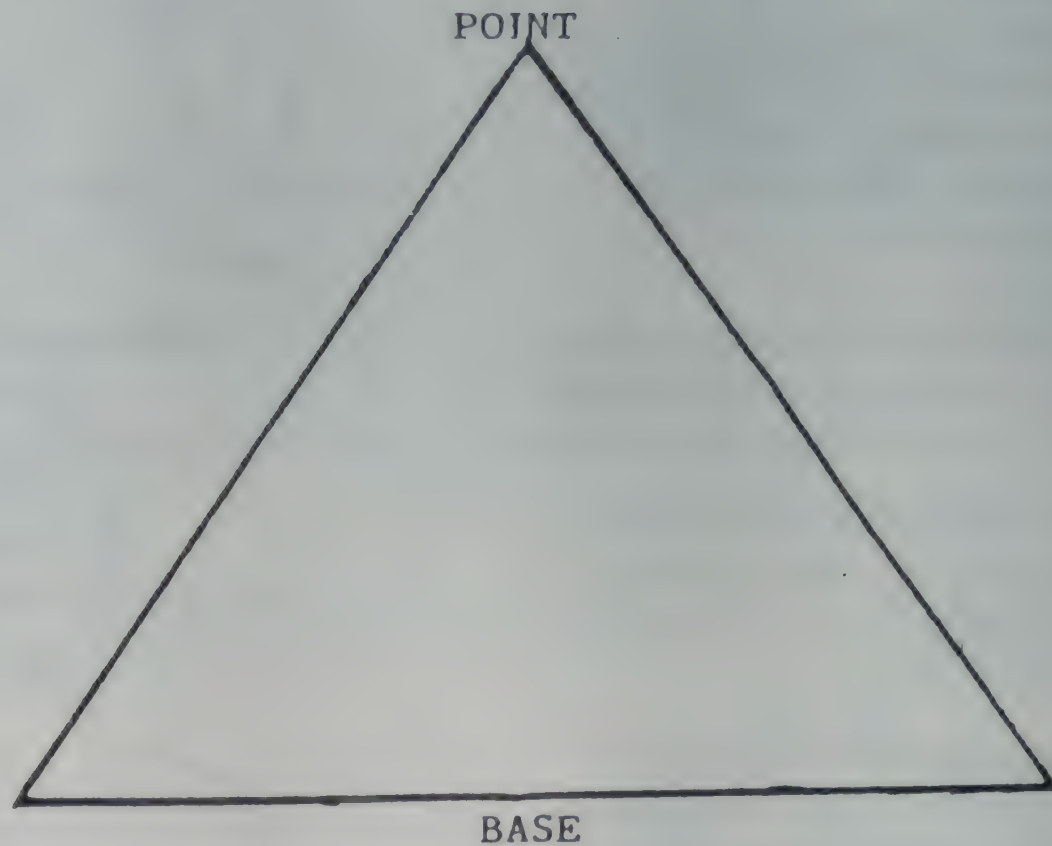
HEAD BANDAGE - CAPELINE

- Used to cover the whole scalp.
- A double-headed roller bandage is used.
- Seat the patient.
- Standing behind, place the centre of the outer surface of the bandage in the centre of the forehead, the lower border of the bandage should lie just above the eye-brows.
- Bring the heads of the bandage round over the temples and above the ears to the nape of the neck. Cross the ends here.
- The upper bandage is now carried round the head. The other is brought over the centre to the top of the scalp of the root of the nose.
- The bandage encircling the head is now brought over the forehead, covering and fixing the bandage which crosses the scalp.
- Bring this bandage now over the scalp, slightly to one side of the centre, thus covering one margin of the original turn.
- Cross it again at the back and fix it by the encircling bandage. Now turn it back over the scalp to the opposite side of the centre line, now covering the other margin of its original turn.
- Repeat these backward and forward turns to alternate sides of the centre, each one being in turn fixed by the encircling bandage, until the whole scalp is covered.
- Complete with a circular turn round the head.
- Pin in the centre of the forehead.



TRIANGULAR BANDAGE

Parts Of A Triangular Bandage



Made by cutting a cloth 4 meters square diagonally into 2 parts .

Uses Of Triangular Bandage

It can be used in various forms:

- As a whole cloth spread out fully.
- The point is brought down to the centre of the base. The bandage is again folded in the same direction.
- As a narrow bandage, by folding the broad bandage once again in the same direction.
- A reef knot and not a granny knot should always be used ,as granny knot slips easily.
- Place the knots in the hollow areas or where it does not cause discomfort.

Use Of Triangular Bandages As Slings

Arm Sling

A1



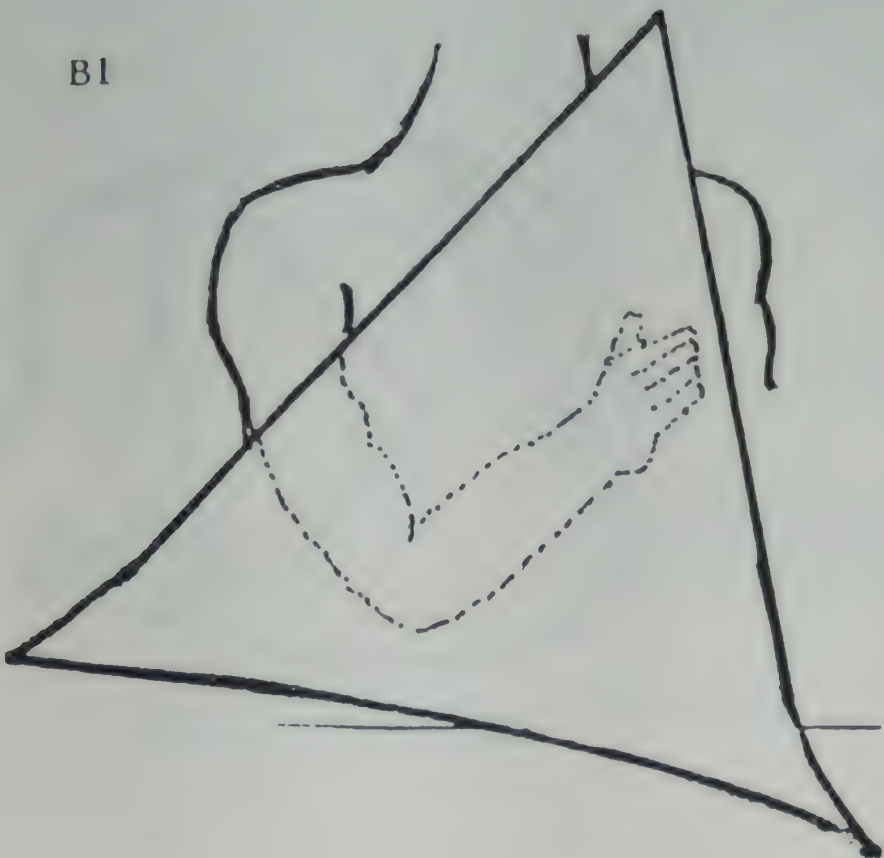
A2



- For fracture of Fore-arm and shoulder wounds. Place a fully open triangular bandage between the arm and the chest with one end around the back of the neck from the uninjured to the injured side.
- Place the arm across the trunk with the hand slightly higher than the elbow. Lift the lower end up to the other end and tie with a reef knot so that the arm is supported with the hand slightly higher than the elbow. Tidy the point by tucking it out of the way.

Triangular Sling

B1



B2



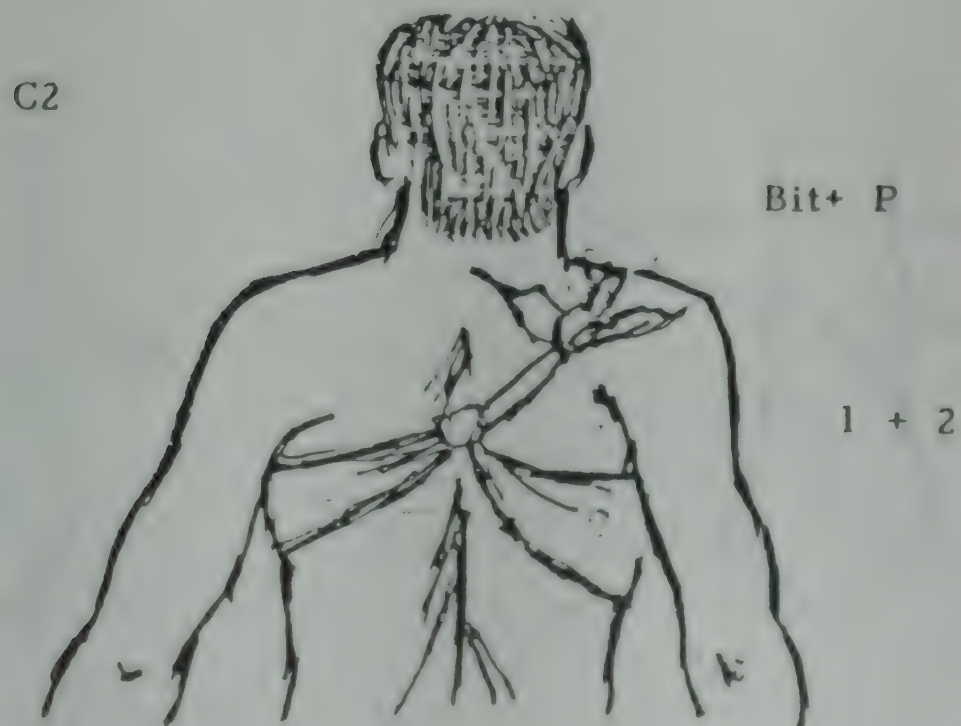
Triangular Bandage is used for fracture of the upper arm, hand injuries and chest injuries.

Chest Bandage

Place a fully open triangular bandage against the chest with the point for the injured shoulder.



Take the ends around the body to the back and tie with a reef knot leaving one long bit. This bit is tied to the point.



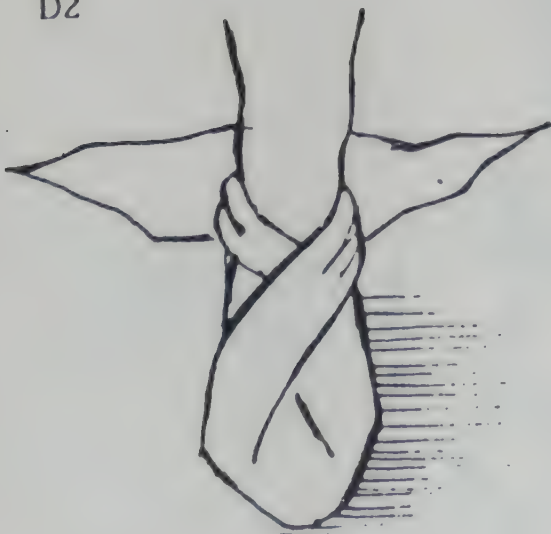
Foot Bandage

As indicated in the figure : D1, D2, D3

D1



D2



D3



CONTINGENCY PLAN AND WARNING SYSTEM

This chapter provides basic guidelines to prepare village level contingency plans. State level and District level contingency plans exist in many States. But such macro plans envisage sole responsibility to Government officials.

If the community is expected to share responsibilities, micro village level plans need to be drawn up. The community should be involved in plan formulation stage also to make the plan more effective and people more responsible.

The following pages detail the process involved in preparatory and formulation phases of village level contingency plans. This chapter explains techniques of making a contingency plan to be a comprehensive, practical action program that would adopt protective, preventive and ameliorative measures to mitigate damages due to disasters.

CONTINGENCY PLAN

A contingency plan is a comprehensive, practical action program to adopt :

- Comprehensive
- Practical
- Protective
- Preventive and
- Ameliorative measures to mitigate damages due to disaster

The plan should be complete in all respects. It should include resource points, problem areas and responsibility allocation.

Resource points : Sources within the village which offer resources such as food and shelter communication and transportation, rescue and medical facilities.

Problem areas : Are the problems that are likely to rise during a disaster such as obstacles in exit routes and people needing assistance during evacuation.

Responsibility allocation Means a pre planned division of work among volunteers who will be involved during a disaster.

How to develop a comprehensive contingency plan for a village?

COMPREHENSIVE PLAN

The geological survey of India's area
(Taluk/mandals/revenue village) maps could
form the basis.



From this a 5 km radius sketch plan could be developed for the village. Care should be taken to clearly highlight landmark and approach routes surrounding the village.





Involvement of elders and youth from that particular village is necessary.

Detailed discussions with the elders will help in this aspect. They will be able to point out the direction, distance and routes to nearest post offices/telegraphic office, Railway station, bus stand, Cyclone shelters/other safe structures, Market places, and Government offices.



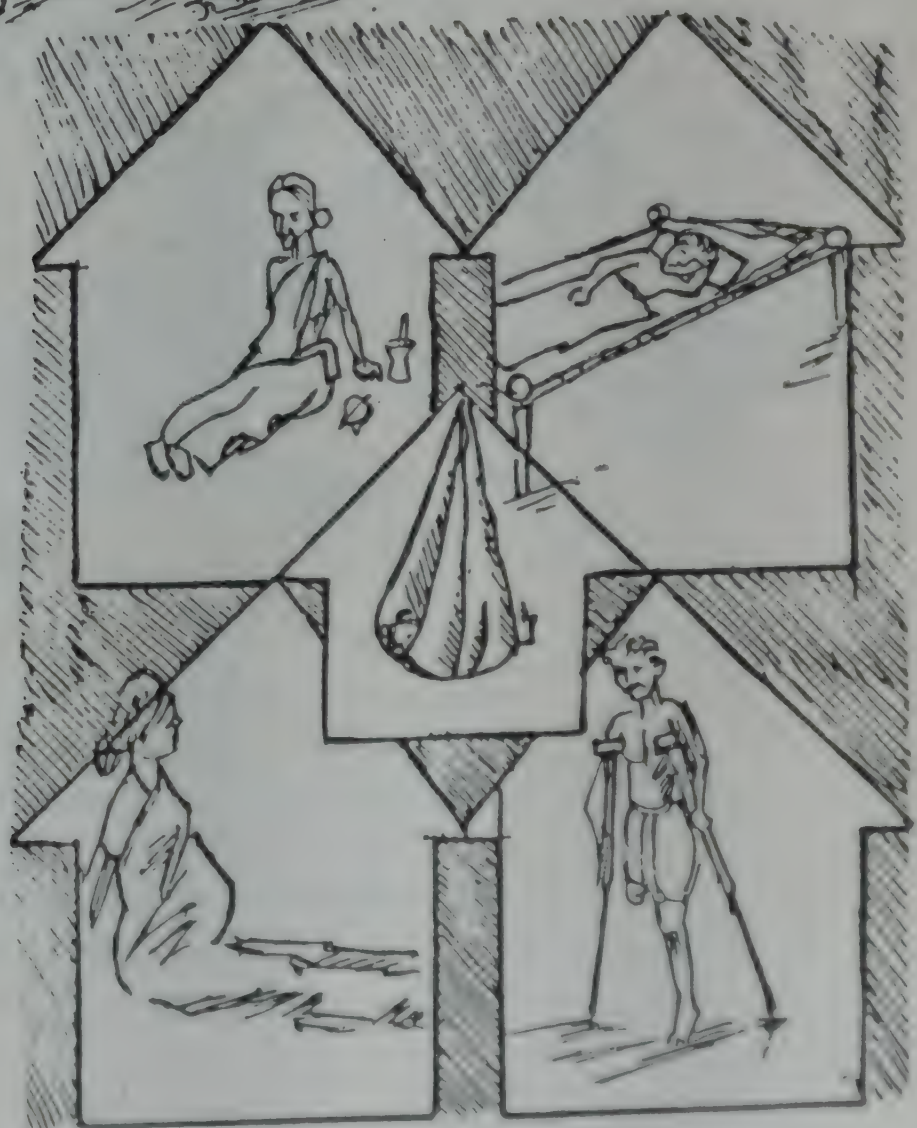
The youth of the village should be involved in a house to house survey.



The survey should include

- Sick
- Elderly
- Handicapped.
- Pregnant women and
- Infants.

in each household. This is essential as these people need special assistance in case of emergency evacuation.



A detailed layout map of the village indicating residences of these people who need assistance has to be developed next.



The layout map should detail-

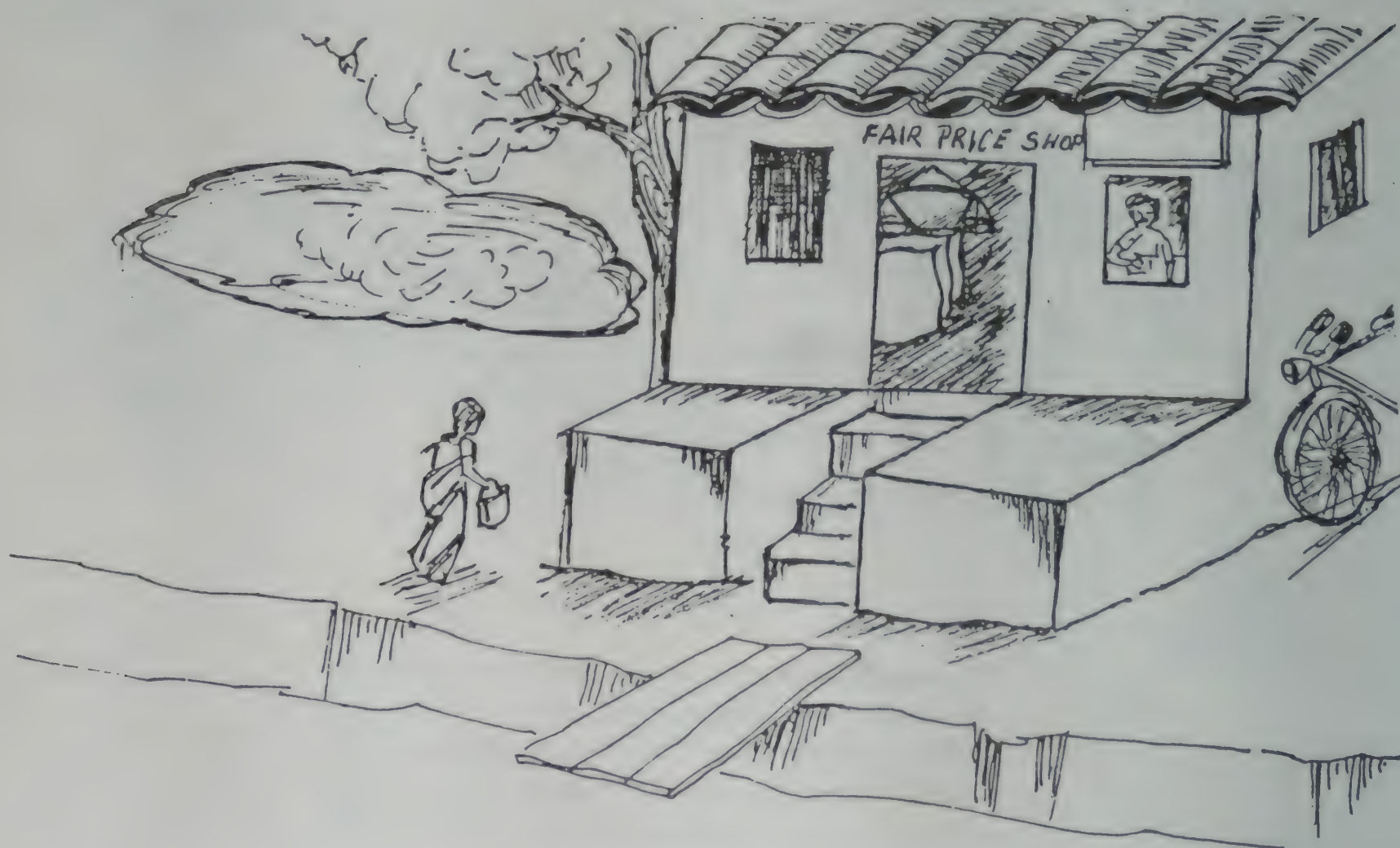
- lowlying areas within the village.
- highlying areas .
- Structures.
- Approach routes to them.



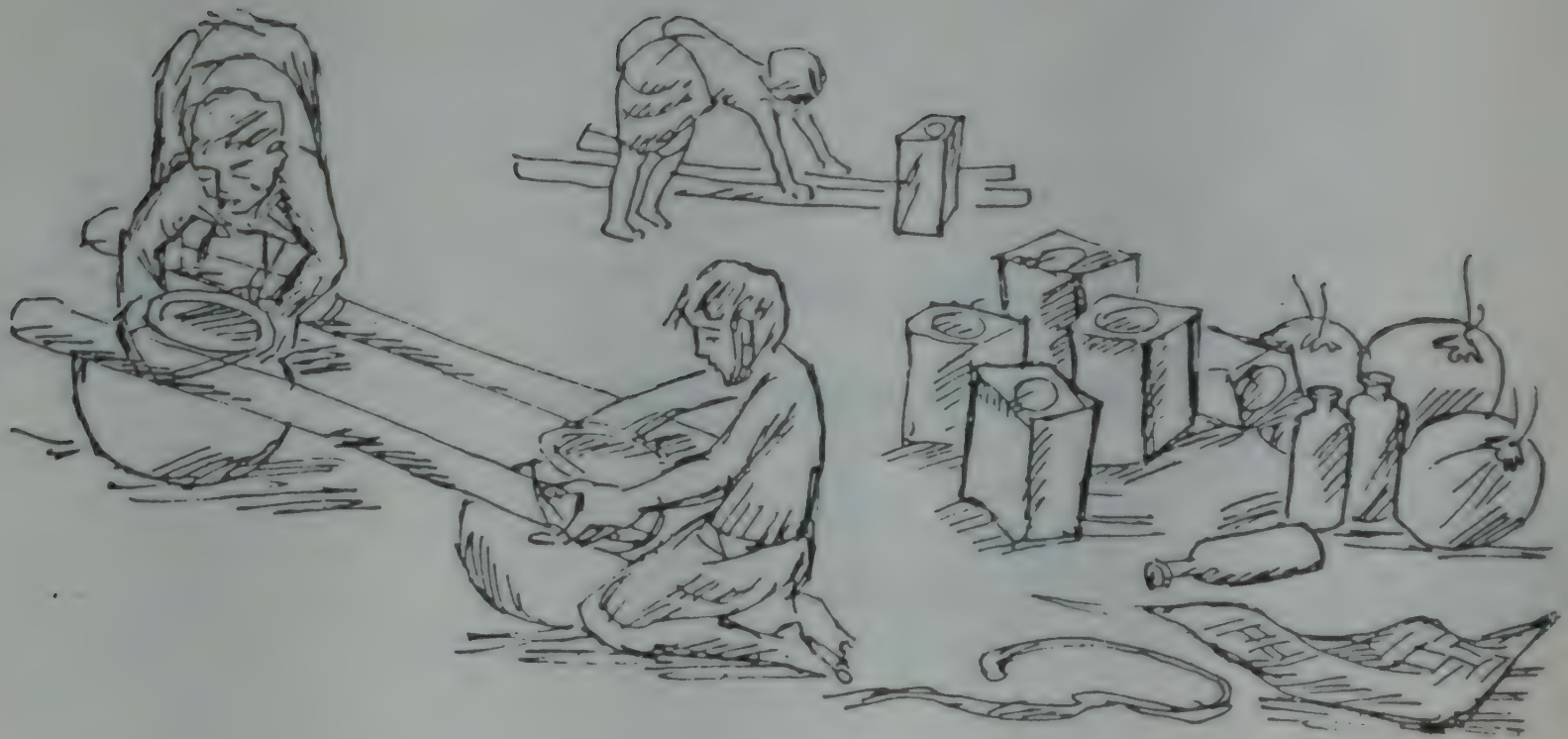
A couple of maps - 5 km radius sketch map and detailed village layout map are not sufficient. Lists of resource points, problem areas and responsibility allocation should be prepared and attached to the maps. Only then it becomes a plan.

Resource points in a village

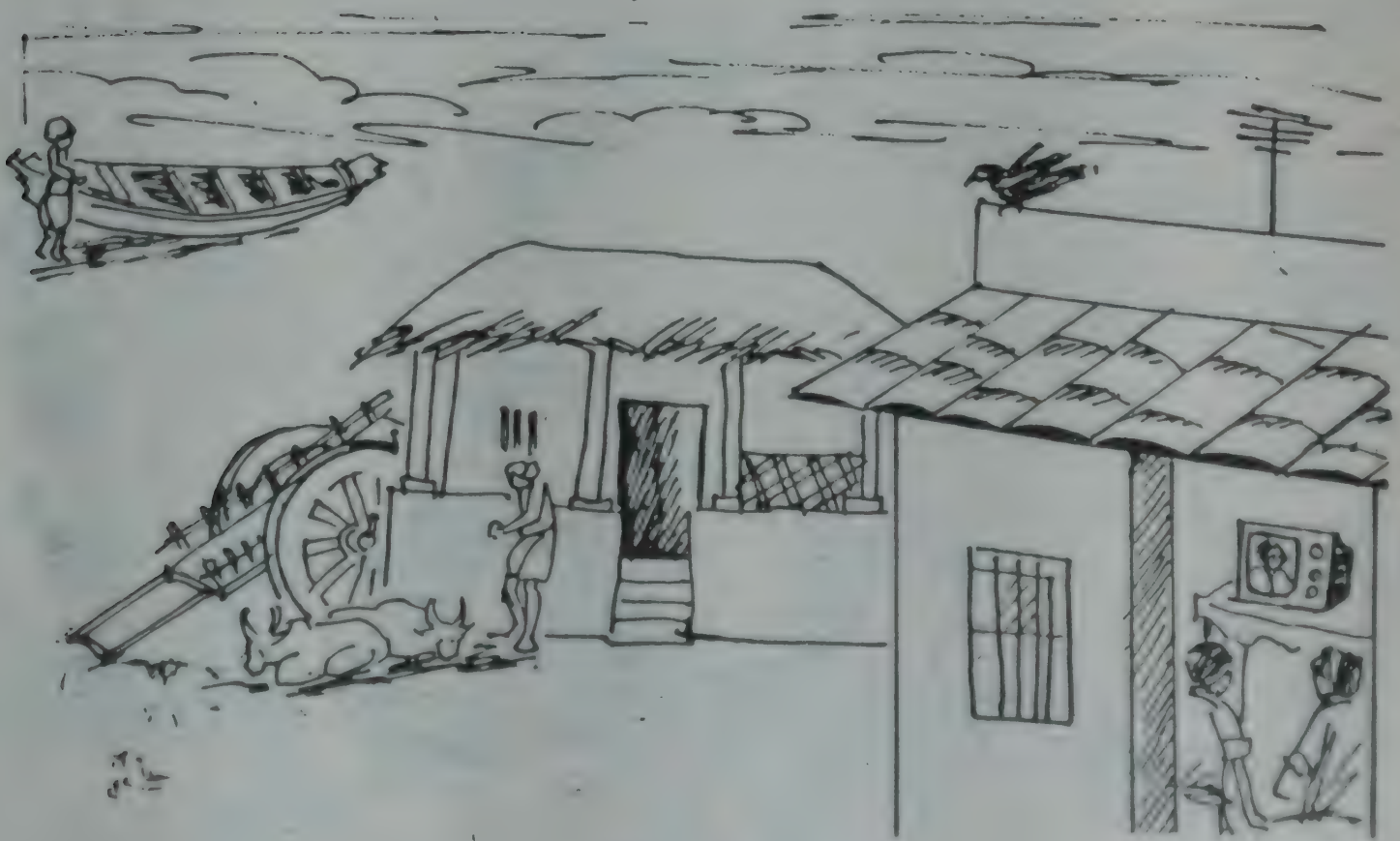
- Highland buildings.
 - Safe buildings and structures
 - Exit routes.
 - Medical kits.
-
- Public distribution system outlets.



- Locally available floating aids and rescue materials like bamboos, ropes, pots etc.



- Community shed , housing TV/Radio.
- Ownership of carts, boats and other modes of transport.



Some Problem Areas

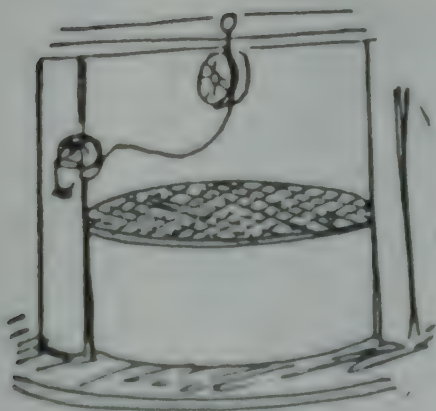
- Lowlying areas.
- Thorny obstacles on routes.
- Pits.
- Marshy areas.



Residence of people who need special assistance.:



Food, water, fuel shortages, etc.



REMEMBER

Responsibility allocation is a decisive list detailing who will tackle which problem and control what resources.

PRACTICAL PLAN

The plan, while being elaborate as mentioned earlier, should also be simple enough to be understood and executed by community level volunteers.

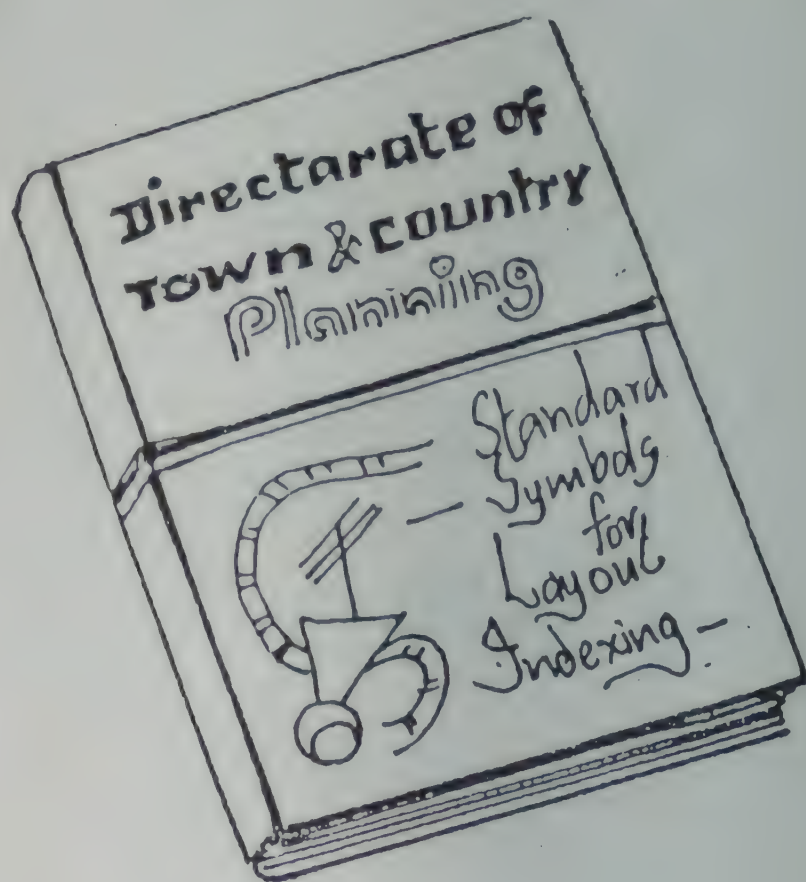
Developing A Practical Plan

Care should be taken in coding and indexing the map. Standard codes approved by local Town and Country Planning authorities should be used to denote Landmarks such as :

- Schools
- Hospitals
- Wells
- Powerlines
- Transformers etc .

This will help even outsiders to read and understand the map and act during times of disasters.

Therefore, seek Town & Country Planning authorities' help in marking and indexing the maps.



If all the youth in the village are involved in the volunteer team, the plan can be practical and put to use during disasters.



Each member in the team should be given specific responsibilities and control of resources. The resources as listed earlier are community sheds with TV/Radio, P.D.S. outlet, carts, boats and other modes of transport, highland buildings, safe structures, exit routes, medical kits, floating aids and rescue materials like bamboos, pots, ropes etc.



Team Responsibilities

- Warning and Information Dissemination to people.
- High risk (special assistance) concentration.
- Streetwise,
- Communication to local officials,



- Medical care ,



- Rescue,
- Evacuation,



- Camp organisation,



- Food and Relief distribution,

- Patrolling of deserted village,

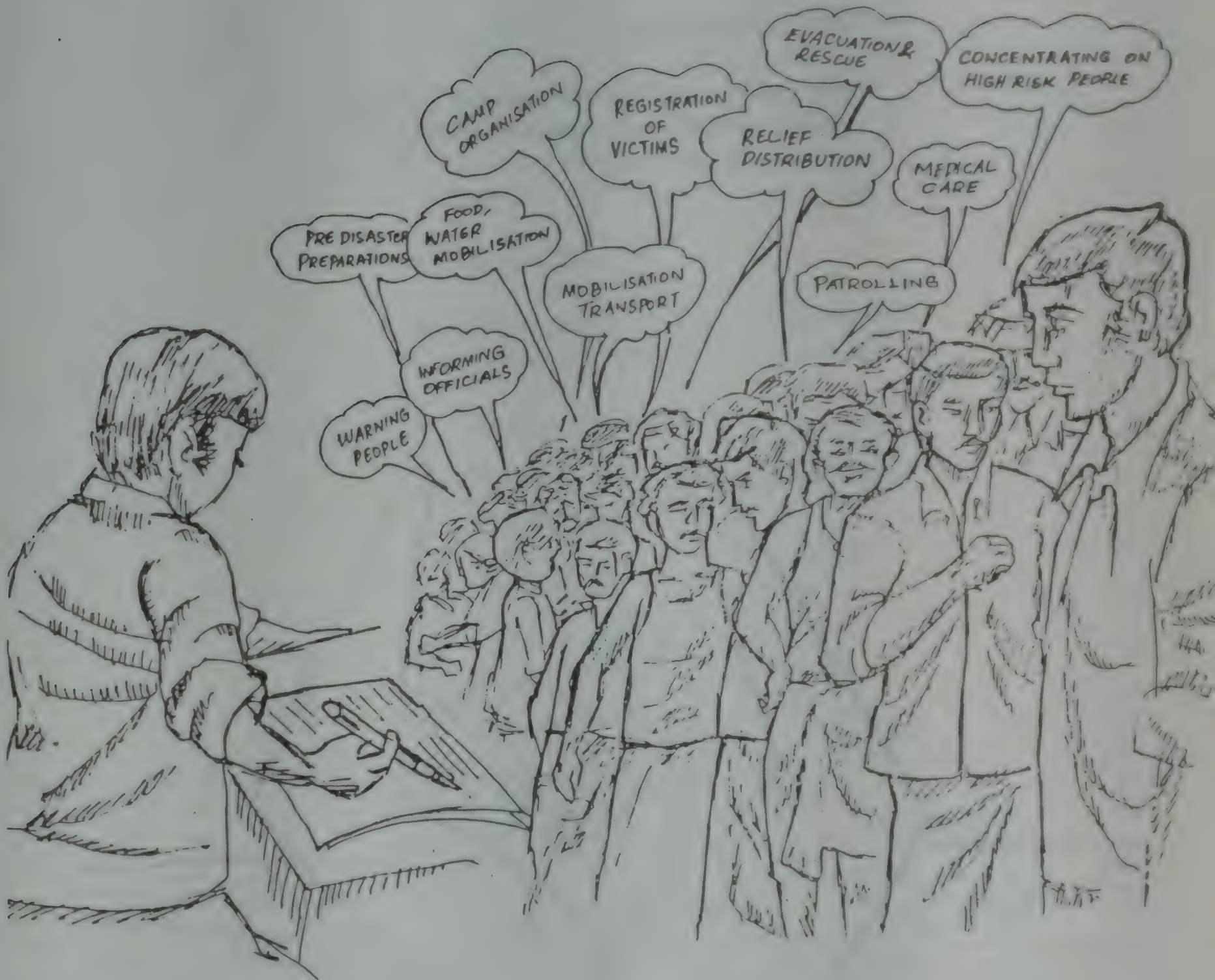


Registration of Victims



A proper matching of resources with responsibility is necessary. For example, persons responsible for warning and information dissemination should have access to the TV/Radio in community shed. This will help them to hear weather forecasts regularly and disseminate warning in time.

List of people responsible for these activities also forms part of the plan.



A Minimum of two members will be necessary to execute each task. This will help them to take turns and continue without interruption.

In this sense we may need a minimum of 25 volunteers for a village. But we can manage even with a smaller team.

PROTECTIVE PLAN

The plan should provide practical means to protect property and lives from disaster.



PROTECTIVE PLAN INCLUDES

Several lists and annexures giving details of

- Trained volunteers
- Safe buildings in and around the village
- Medical facilities
- People responsible for maintenance of carts, cyclone shelters
- Clear safe routes of exit
- Cattle herds who will be responsible for livestock.



PREVENTIVE PLAN

The plan should facilitate preventive action by the community by providing adequate access to warnings.

What are the preventive actions?

- Not sailing out for fishing.
- Securing thatch roofs with fishing nets.
- Shifting animals and assets to safer altitudes.
- Storing food, drinking water and adequate fuel.
- Evacuating at the earliest to safer places.



WARNING SYSTEM

Warnings play an important role. Recent technology developments help in receipt of meteorological data well in advance. Super computers help in speedy analysis, interpretation and forecast.

Warning System Is Aimed At

- Primary group - people who live at the place where the disaster strikes.
- Secondary group - living outside the circle. This group rushes to help the affected people.

Warning Message Should Contain

- Severity of the cyclone.
- Where it would cross.
- When it would cross.
- Which areas are affected.
- Type of damage.
- Evacuation advices.

The Team Should Know

Signs Of A Cyclone

- The type of wind mild/medium/strong.
- Direction of wind.
- Height of waves.
- Changes in undercurrent.
- Bulls restless, scratching ground with hooves.
- Disappearance of some varieties of fish and appearance of some other.
- The overcast sky
- Disappearance of birds.

Often used terms are:

	Km/hr.
Low pressure	upto 30
Depression	31 - 50
Deep-Depression	51 - 60
Cyclone	61 - 85
Severe cyclone	86 - 115
Hurricane	116 & above

WIND SPEED AND POSSIBLE DAMAGES

Speed	Name	Damage
0 - 50	Strong breeze	Large branches in motion
- 60	near gale	Whole trees shake Whistling telegraph wires
- 70	gale	Small branches break off.
- 85	Strong gale	Huts are slightly damaged
- 100 -	Storm(Cyclone)	Trees uprooted, Buildings damaged
- 115	violent storm Hurricane	Widespread damage

Weather forecasts are received by local govt. officials. They try to warn the community. They disseminate information through radios and messengers to reach all prone villages.



If this information reaches every person in the village,, people will be prepared to face a disaster and prevent damages.

But practically this warning does not reach every person in the villages. Even among the people who receive the warnings, not all believe them. Thus the trainer and the volunteer team have two important tasks in this context:

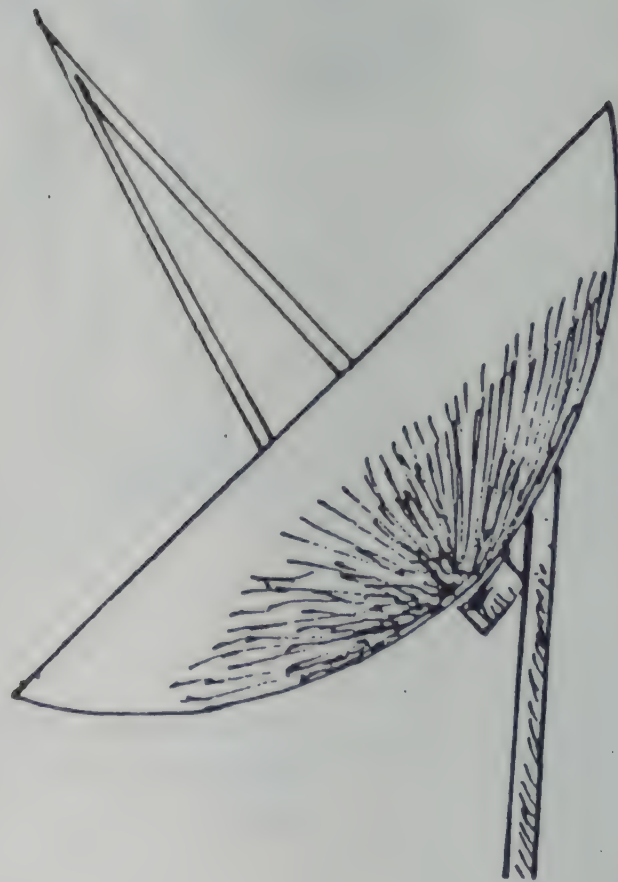
- To ensure that warning reaches everybody the moment it is received, and
- To educate the community on the efficiency of the warning system.



Educating is important as many do not have faith in weather forecasts and disaster warnings.

Satellite pictures, radar scanning and super computer analysis should be explained.

- District Collector's access to such facilities should be highlighted.
- This exercise should be done several times during normal days.



- Persons who have no faith in these forecasts and warnings could be taken to nearby Radar Tracking Stations.
- This will help them to understand and appreciate the technology involved.



List of people responsible for these activities also forms part of the plan. This is important as warnings facilitate preventive action.

POST-DISASTER IMPROVEMENTS

Whatever precautions are followed damages during disasters are unavoidable. At best these precautions can mitigate damages. Major and minor damages are bound to occur during a major disaster.

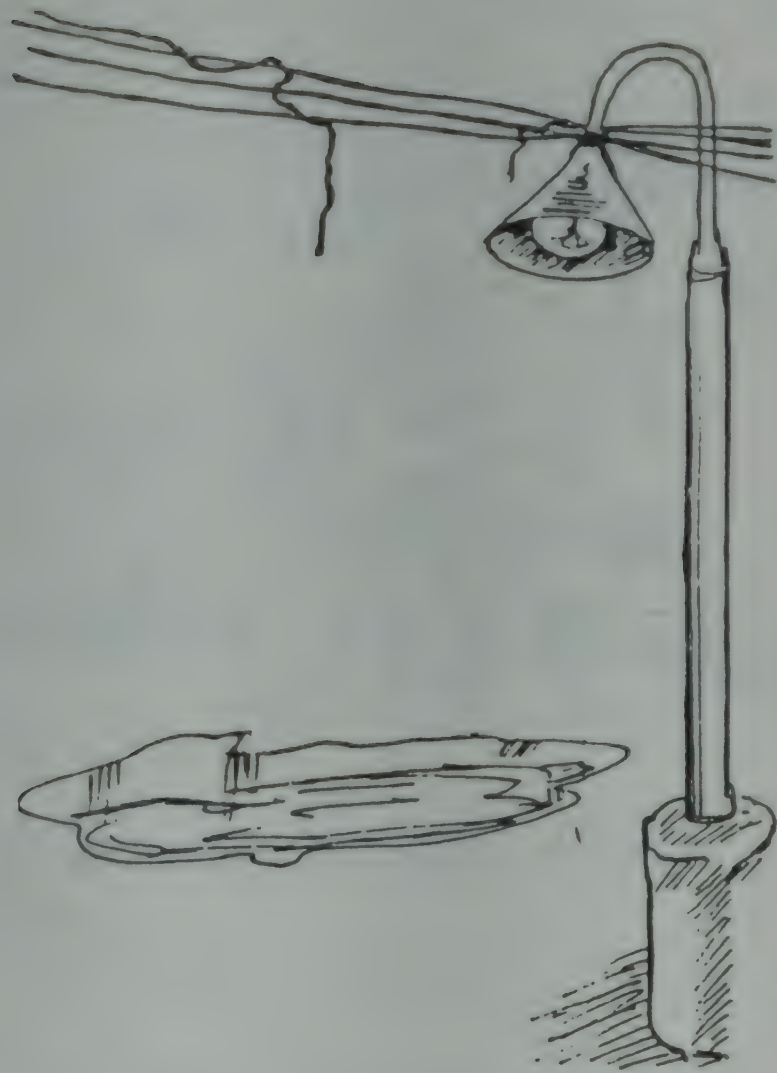
Major rehabilitation is normally the responsibility of the Government. But basic improvements should be community's responsibility.

What Community Can Do

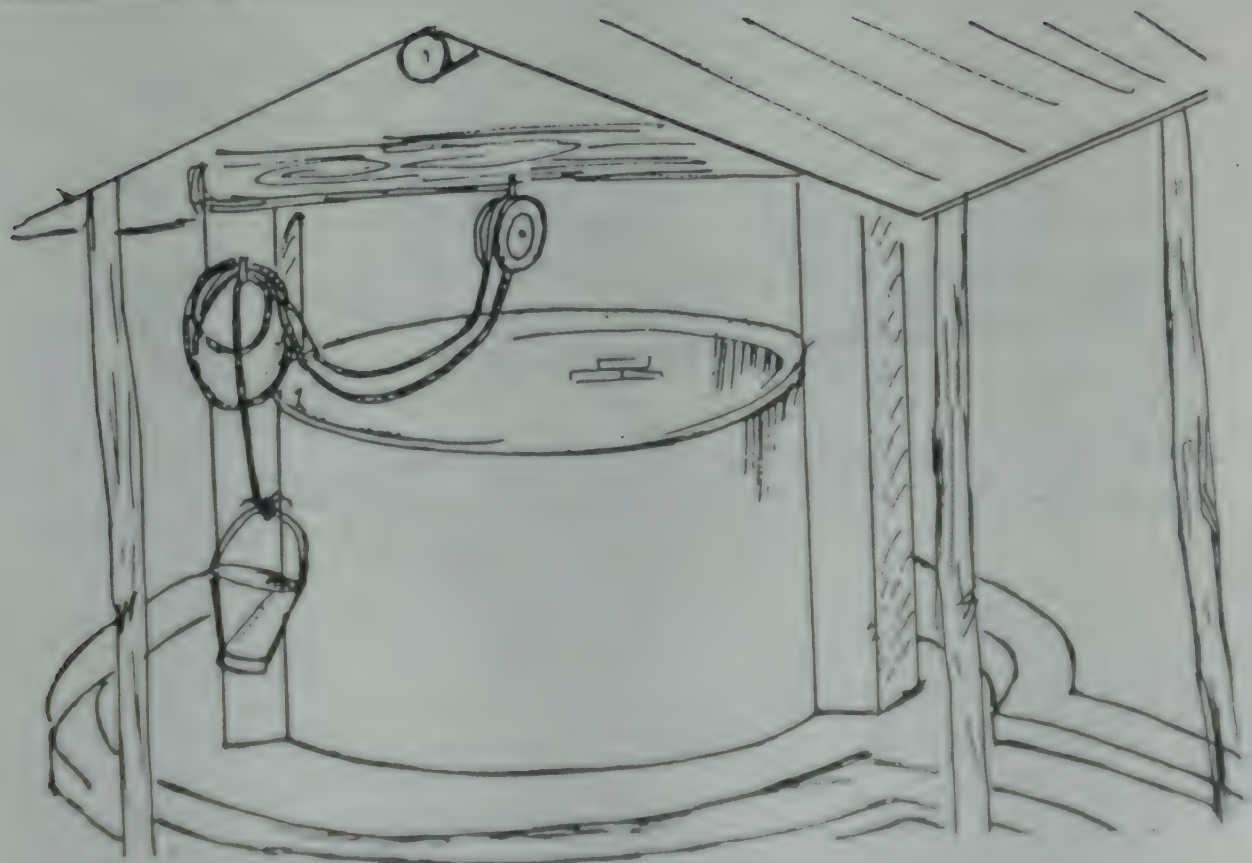
Repair and relaying of temporary bridges.



Helping electricity Board staff in power restoration (under their supervision).



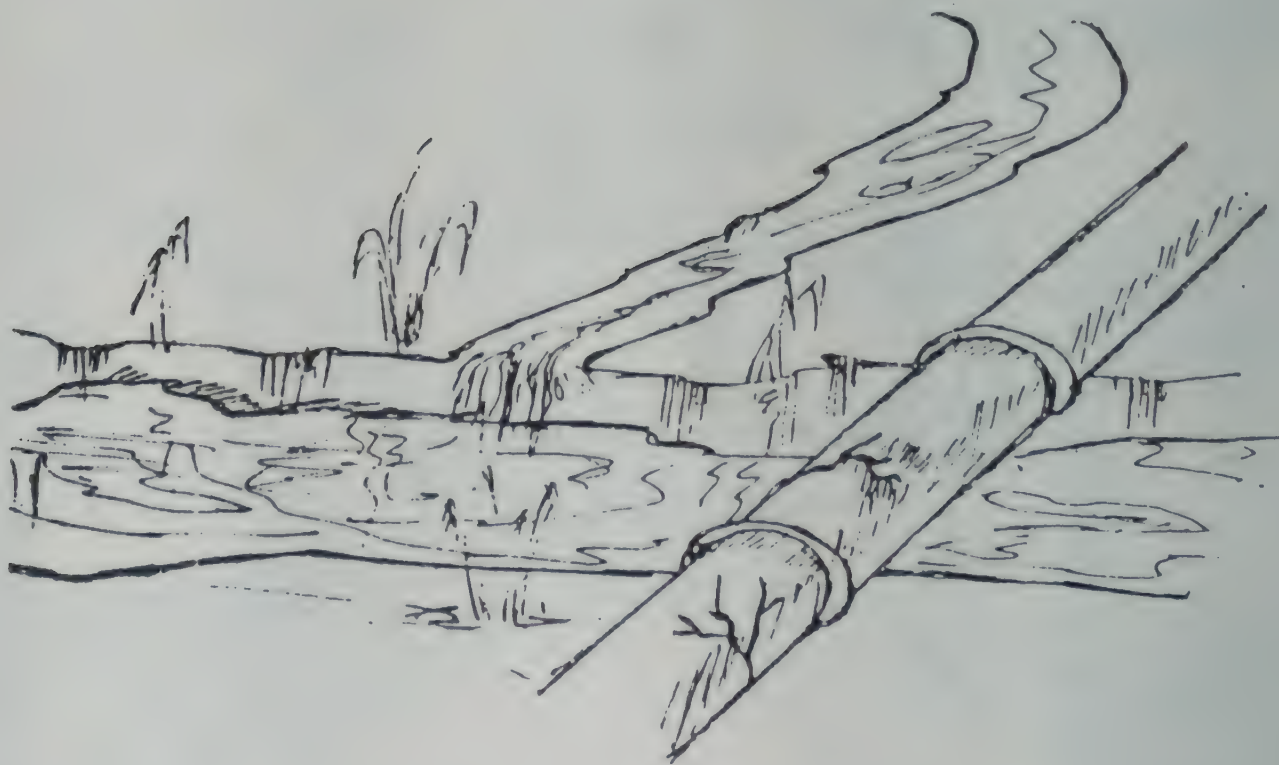
Chlorination of wells.



Small reclamation to soil erosion/minor
landslide, affected pathways.



Minor repairs to drainage damages.



AMELIORATIVE PLAN

The plan should provide for means to improve environment of the victims before and after the disaster.

What improvement activities could be taken before a disaster?

✓ Clearing of thorny bushes from exit routes.

✓ Filling pits that may not be visible when flooded.

✓ Providing water and sanitation facilities near potential relief camp sites and shelters are some of the important activities that could be undertaken before the disaster.

✓ Thus, a list of people responsible for these activities should also form part of the plan.

Shedf,

Sometimes people are sheltered in safe private houses within the village. In such cases these houses should be identified and owner's consent should be obtained well in advance. Owners may prefer sheltering their relatives and friends in the village. Their preference should be kept in mind while distributing victims.

Care should be taken not to overcrowd these houses. Capacity of the house (after leaving adequate space for owner's family) should be estimated and indicated in the plan.

Women may have to endure hardships. They may be held up in queues for fairly long time awaiting their turn to receive rations. In crowded indoors children get restless and may disturb others. Mothers should be mentally prepared to withstand such pressures.

Some volunteers could take responsibility for these works. A list of volunteers taking up this could also be attached to the plan.

**PURIFICATION OF WATER
AND
SANITATION**

Access to safe water for many of the rural populace and the urban poor is still a mirage. Pollution of both surface and ground water sources has led to a sharp decline in the quality of water which by itself is a diminishing commodity.

Disasters, whether natural or man made, first affect the quality of water due to influx of population, pressure on an already vulnerable distributive system, pollution of water sources by debris and carcasses leading to resultant health hazards.

Purification techniques for day-to-day use and during disasters are discussed in detail. Pot and well chlorination, 3-pot filters, chlorination during disasters and the importance of environmental sanitation are some of the major aspects of water purification illustrated in the following pages.

SOURCES

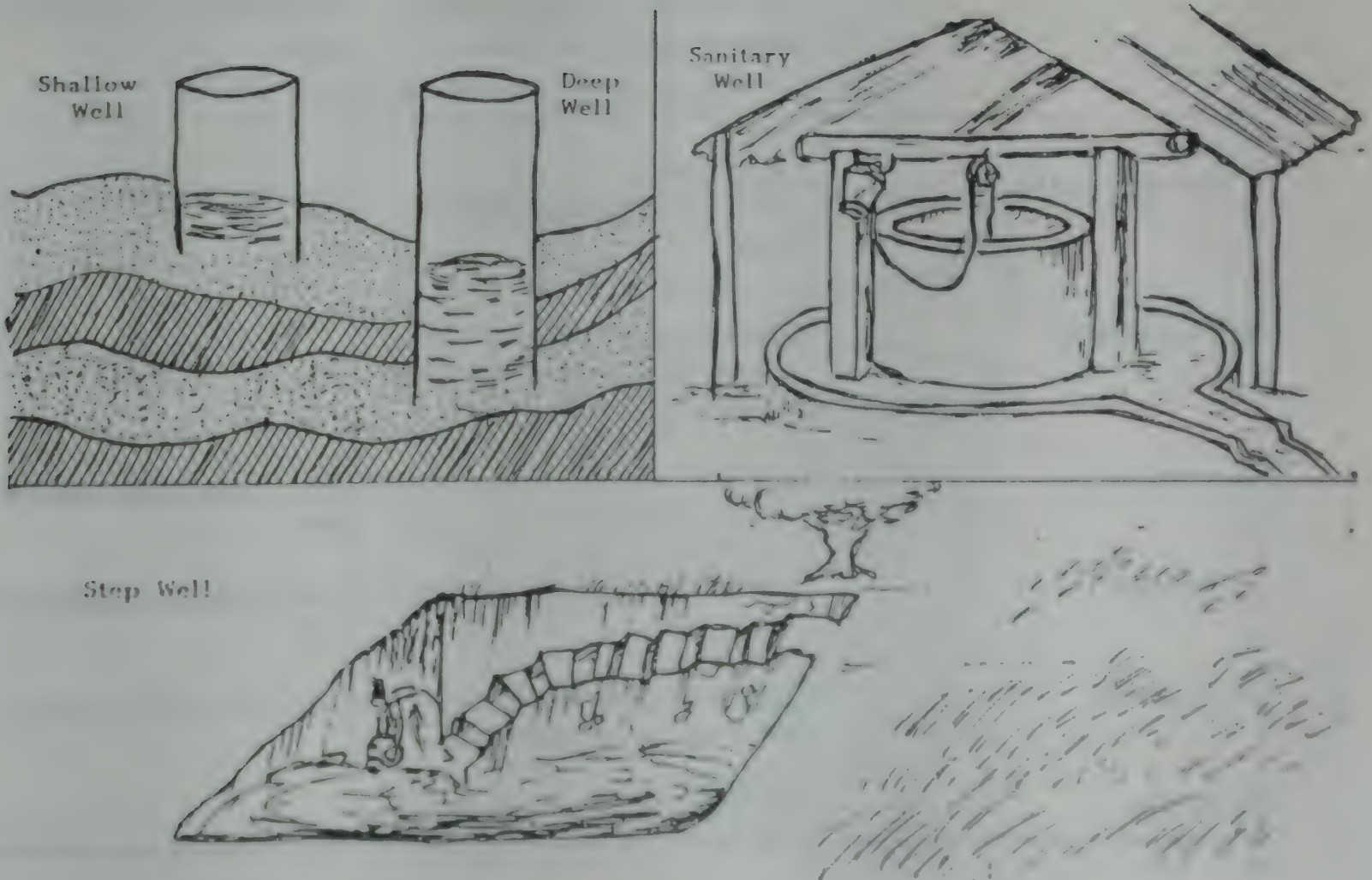
1. Rain water

2. Surface water

- Reservoir
- River
- Tanks

3. Ground water

- Shallow wells
- Deep Wells
- Pucca Wells
- Kutcha Wells
- Step Wells
- Tube Wells
- Springs



BEST SOURCE OF WATER DEPENDS ON . . .

- Quantity
- Availability
- Quality Of Water (physical, chemical, bacteriological)
- Quantity of water required depends on purpose of use
- Personal use = 150-200 Litres /day/ person

SOURCE	CHARACTERISTIC	IMPURITIES
RAIN	Pure, Sparkling, Soft, Corrosive	Gathers from the Atmosphere- Gases, Dust, Soot
SURFACE WATER	Clear, Palatable, Reasonably Pure	Human and Animal Waste from Catchment area
a) Impounding Reservoir.		
b) Rivers	Grossly polluted not clear	Surface washings, sewage, In- dustrial waste, Trade Waste, Pes- ticides
c) Tanks	Grossly Polluted, can be improved by -- Fencing, Cleaning, Elevating Edges, Digging Tube Wells.	Surface Washings, Sewage, In- dustrial Waste, Trade Wastes, Pes- ticides
GROUND WATER,	Pure, Cheap Supply even, Requires lifting of water	High mineral content
a) Sanitary Well	Covered platform, Drain 50m from contamination, lined for first 20m, Hand Pump.	
b) Kutcha Well	Un lined	From Surroundings seep into the well
c) Step Well	Polluted, Spreads Guinea Worms	From Consumers stepping in to the well
d) Tube Wells	Clean Water, Needs hand pumps and maintenance, even supply	From water used for priming
e) Springs	Quality and quantity not dependable	

Physical Qualities :

- Clarity - Helps in assessment of contamination and in purification.
- Colour - Water should be colourless
- Smell - acceptable to the consumer
- Taste - not a disagreeable taste

REMEMBER

Sweet And Clear Water Is Not Always Safe.

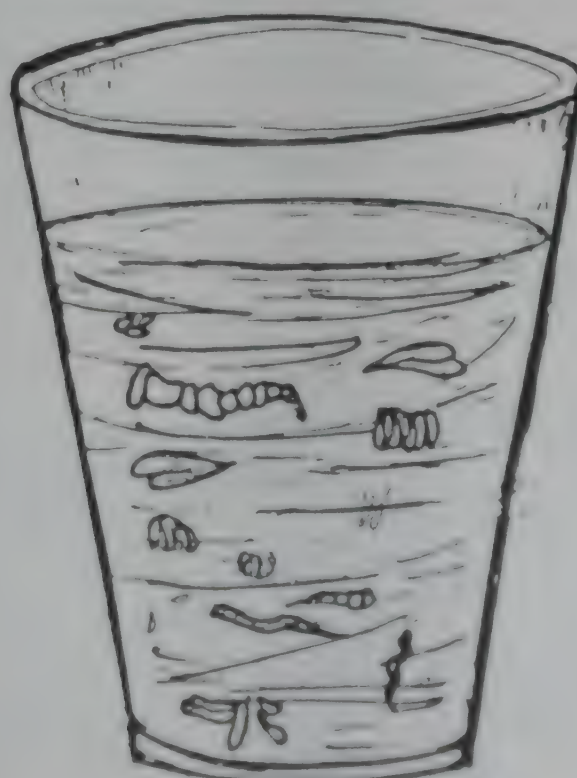
Biological Qualities

- Absence of larvae, parasitic worms and eggs, bacteria such as E-coli, viruses such as polio etc.

Chemical Qualities.

- Metals such as Arsenic, Cyanide, Lead, Iron, Chloride and Nitrites etc.
- Presence of some of these show contamination by human faeces .

What a glass of water could contain...



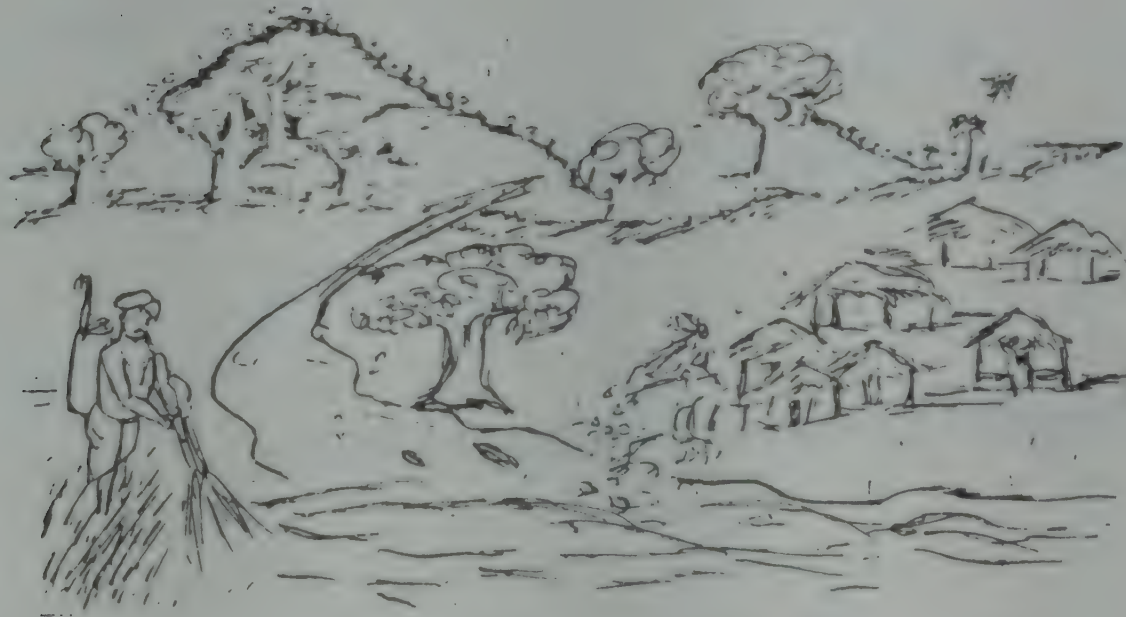
CLASSIFICATION OF POLLUTANTS

- Physical pollutants :- Colouring agents mud, radioactive rays, Leaves
- Chemical pollutants :- Iron, flouride etc.
- Bacterial,viral pollutants E.- coli, polio virus etc.

May be

Dissolved	gases, colouring matter
Suspended	Leaves. Clay, Silt,, Plants, Worms Etc.

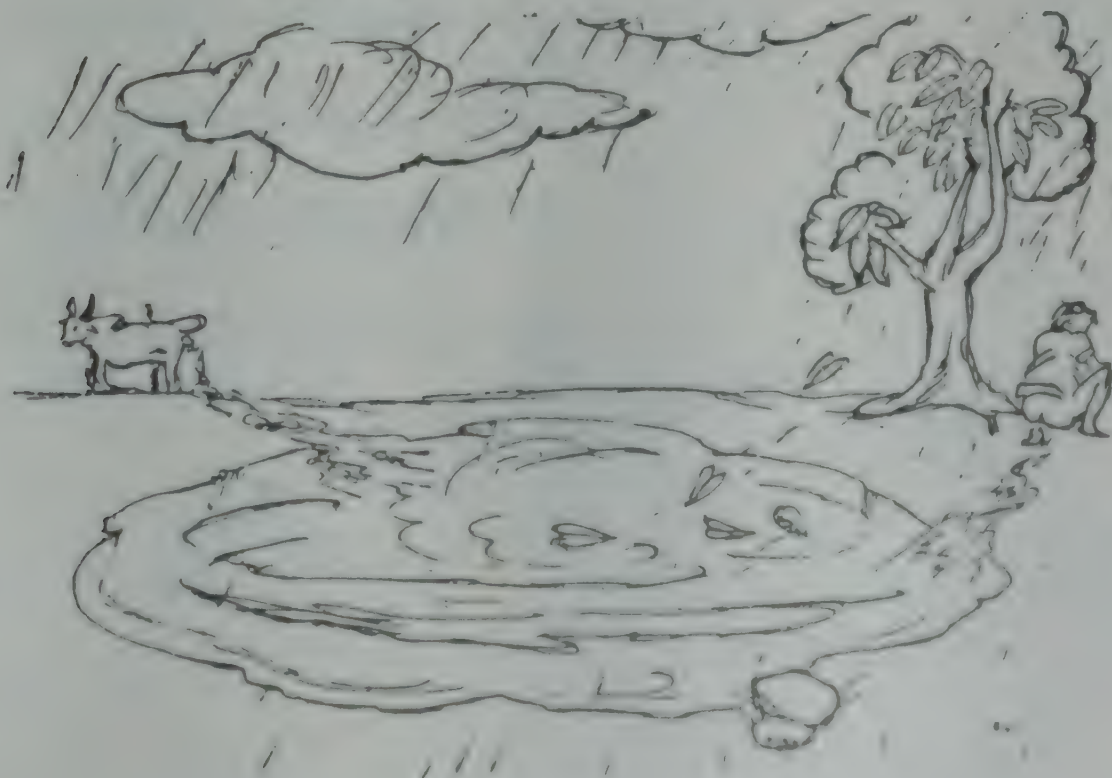
WATER POLLUTION



- Means of pollution
- Indiscriminate defaecation
 - Agricultural irrigation - pesticides, fertilisers and dead leaves.
 - Household and street refuse.
 - Industrial/trade waste.
 - Radioactive substances.

Man is affected by.

Drinking, cleaning himself, swimming, eating foods grown in such water.



CHEMICAL POLLUTANTS

Contamination Through Chemicals Leads To :

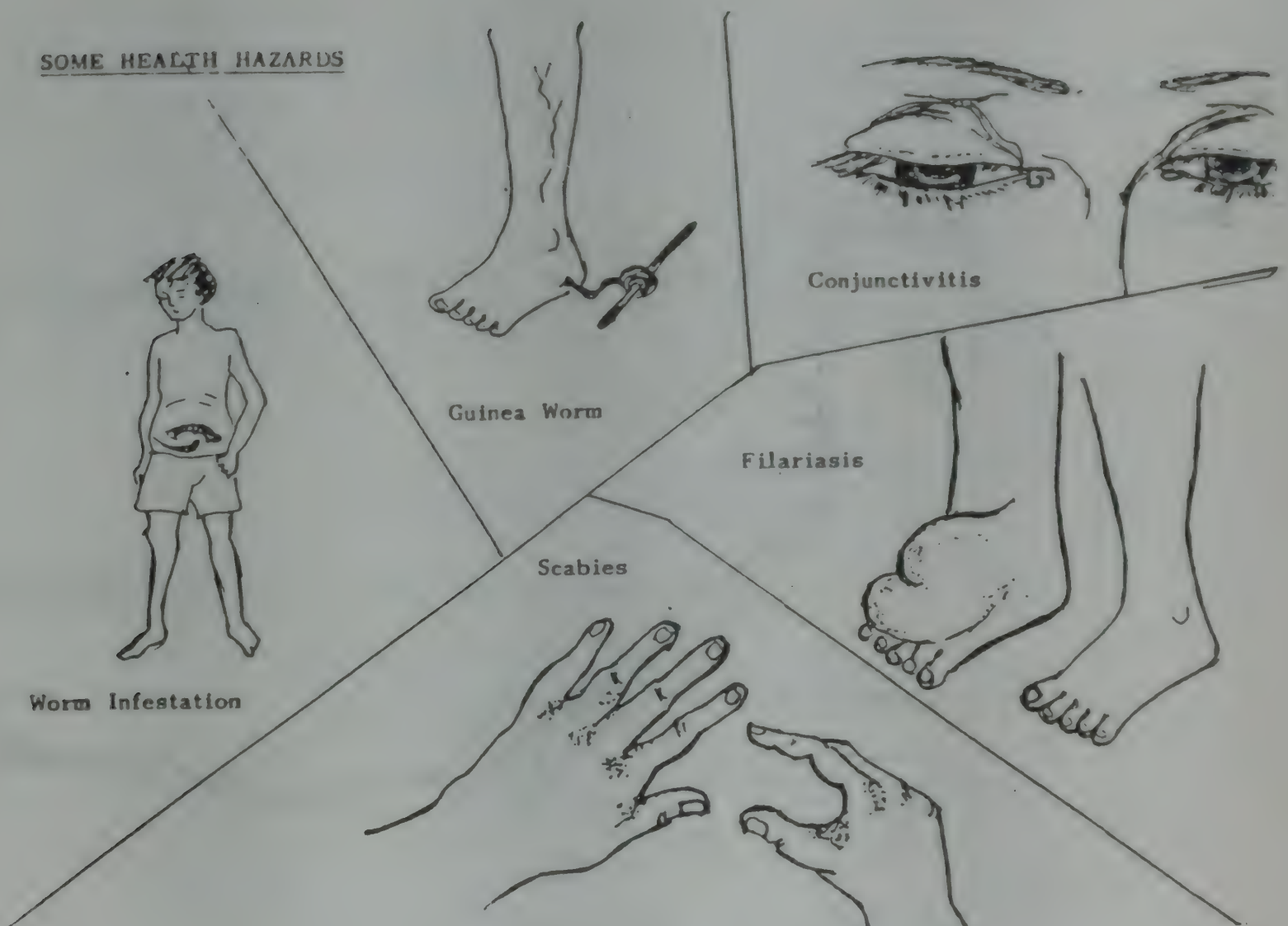
Immediate : Death, abdominal pain etc.

Slow : The body organs are affected.

Eg: Mottling of teeth , Blood production, skin problems .



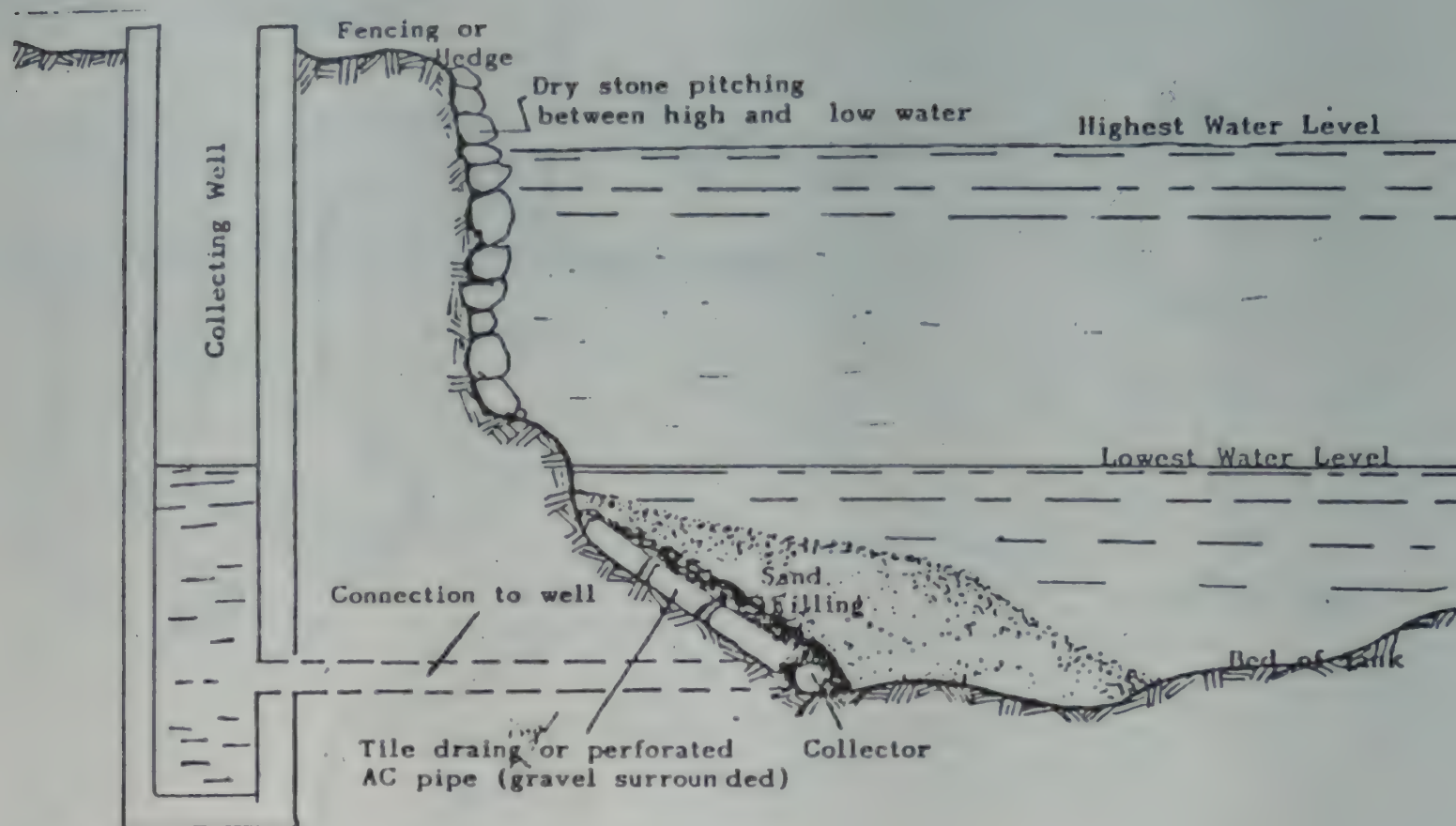
BIOLOGICAL POLLUTANTS



- **Water Borne Diseases** - Infective agent is carried in water.
Eg. Cholera, Worms, typhoid, hepatitis.
- **Water Washed Diseases** - Use of water for personal cleaning.
Eg. Eye infection, Scabies, Fungus.
- **Water Related Diseases** - Water serves as a medium in which vector breeds.
- **Water Based Diseases** - Diseases carrying invertebrates live.
Eg. Snail, cyclops.

MAINTENANCE OF WATER SOURCES

MAINTENANCE OF TANKS



Wells

- Dry the wells once a year.
- Scrape and wash wells.
- Give a coating with milk of lime and allow it to dry.
- Allow for water to fill up.
- Chlorinate every 2 weeks.
- Some fish could be grown to kill harmful organisms.

Ponds/Tanks

- Bar entry directly into tank.
- Erect an elevated platform for drawing water.
- Elevate the tank edges to prevent entry of surface water.
- Provide fencing to prevent animals.
- Chlorination is necessary whenever possible.
- Clean the tank at the end of dry season.

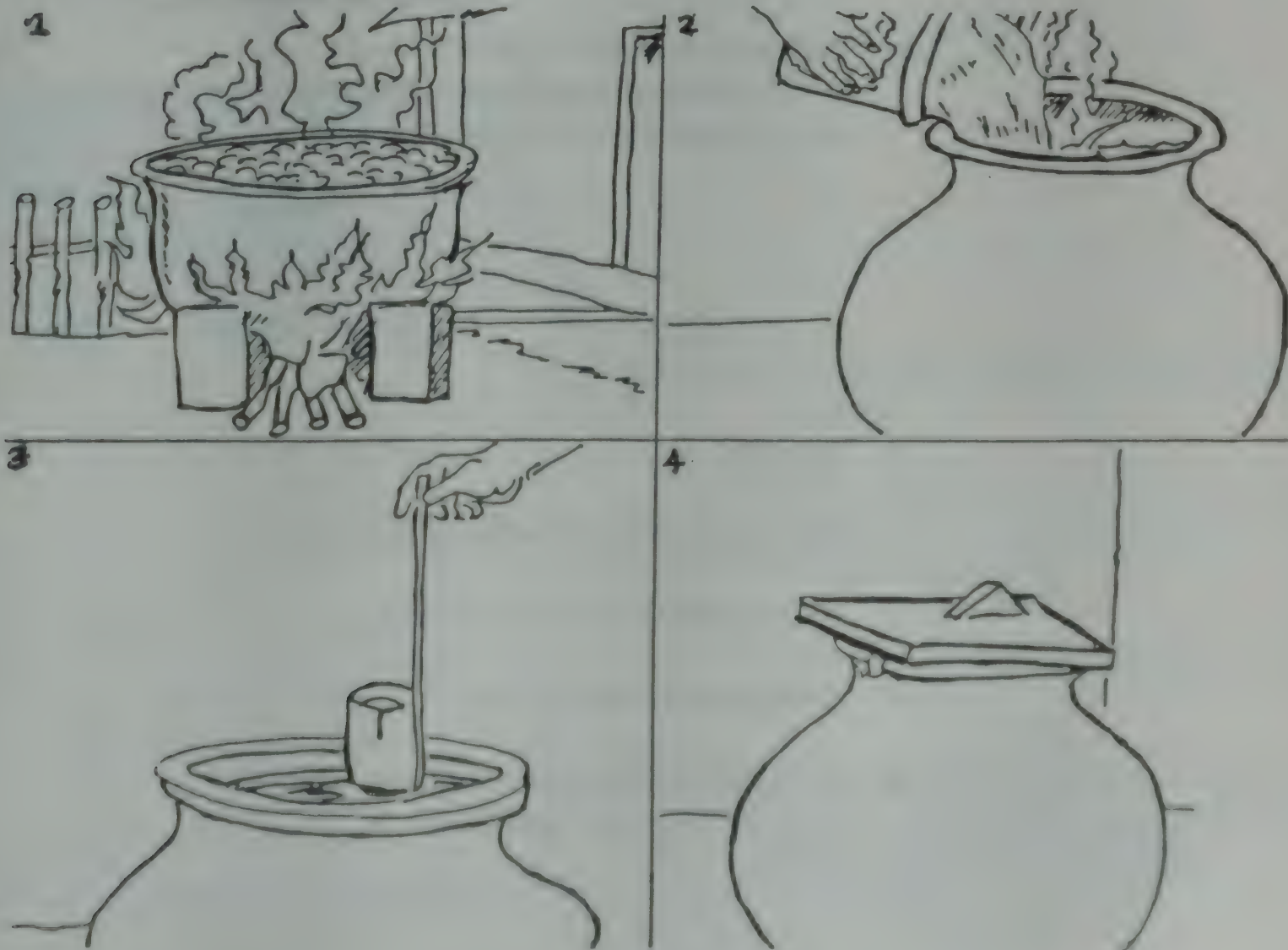
WATER PURIFICATION

- Boiling
- Chlorination
- Filtration
- Storage

Boiling

- Bring the water to rolling boil and keep it boiling for 10 minutes.
- Store in a clean vessel.
- Same container to be used by all to remove water.
- Keep the mouth of container closed.

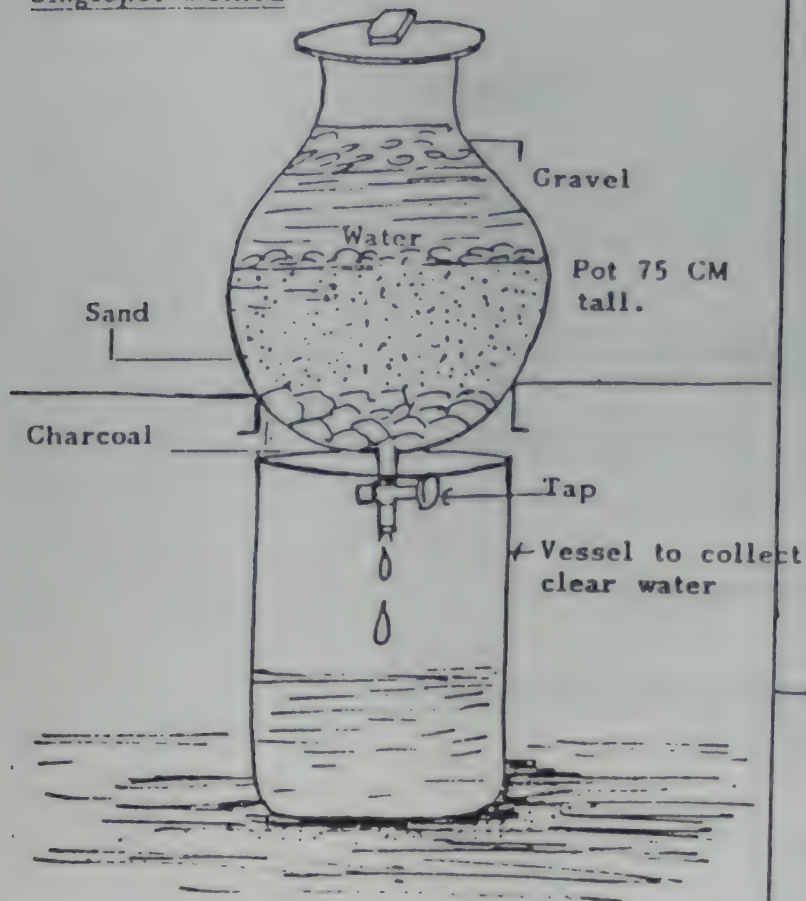
PURIFICATION BY BOILING



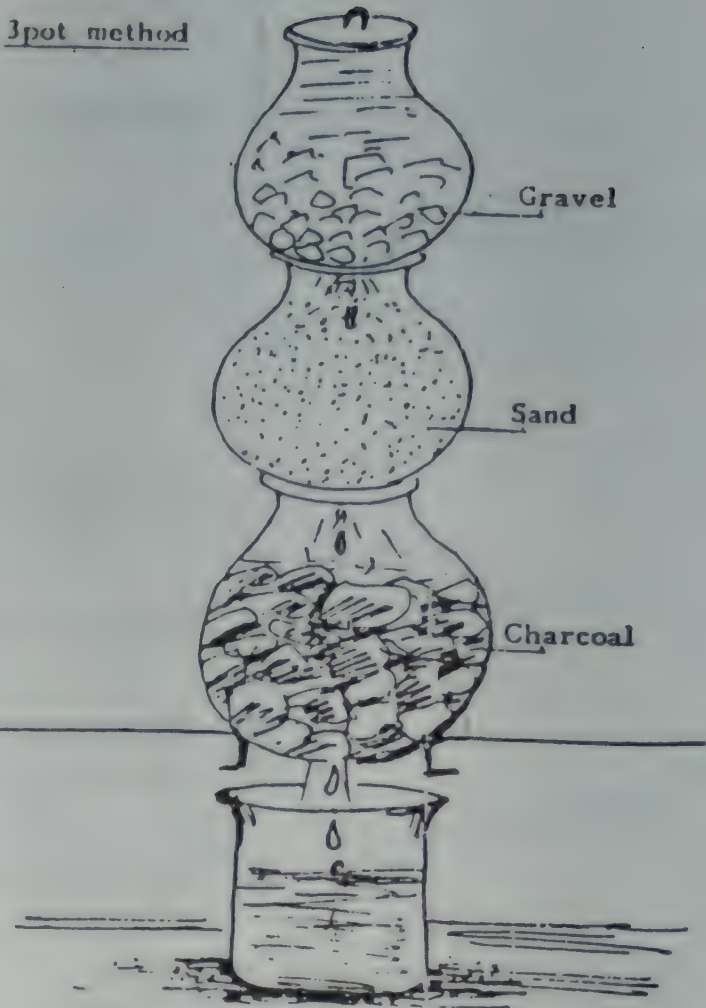
Filtration

Using Clay Pots

Singlepot method



3pot method



- The water is made to pass through sand, gravel or charcoal. Bacteria and other pollutants are removed.

Storage

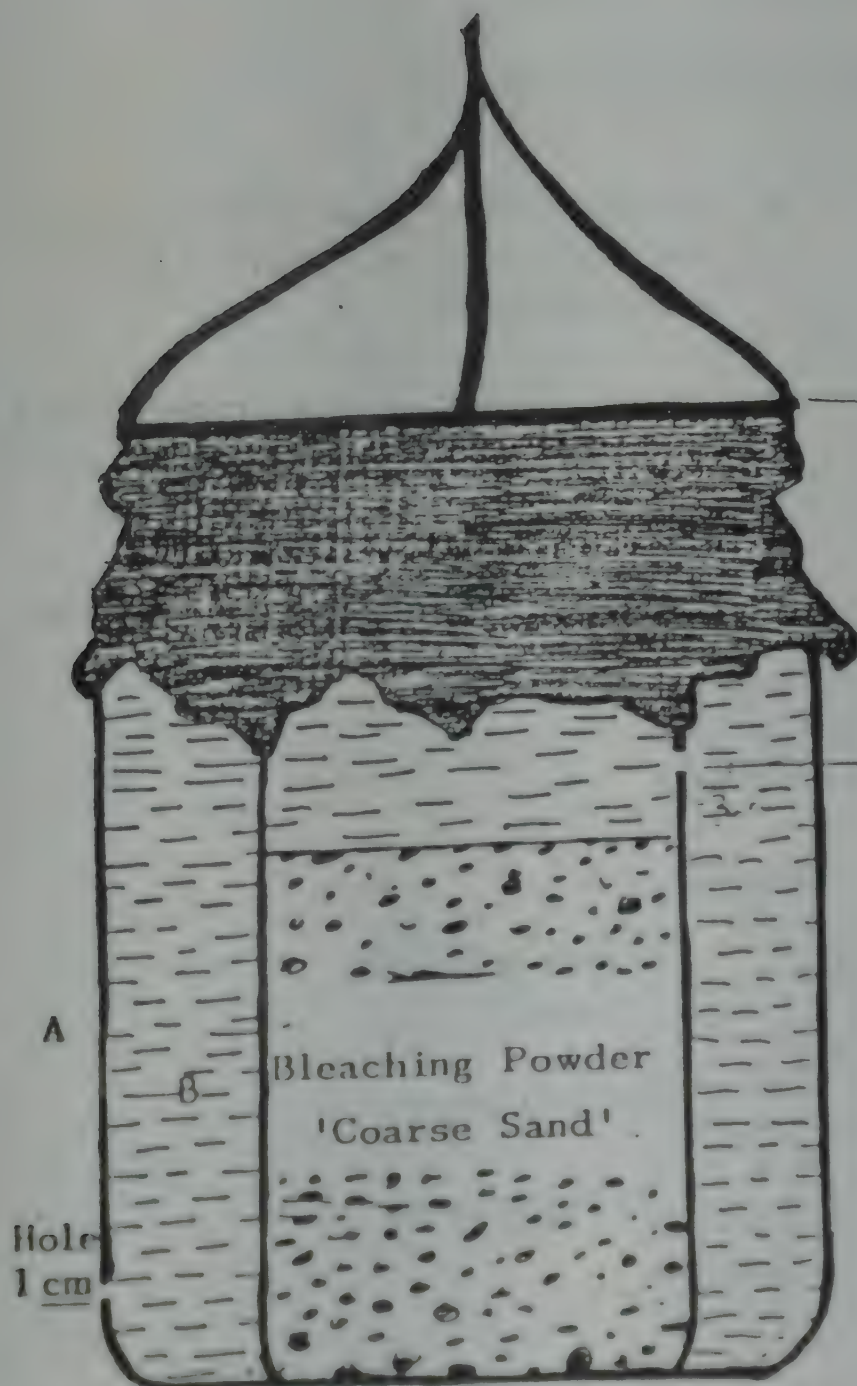
- Simplest
- 90% organisms die within 5 to 7 days
- Dead matter become harmless
- solids settle at the bottom
- Addition of Aluminium Sulphate (Alum) 80 GM/100 Litres helps to settle the solids.

Chlorination (using Bleaching Powder)

RULE

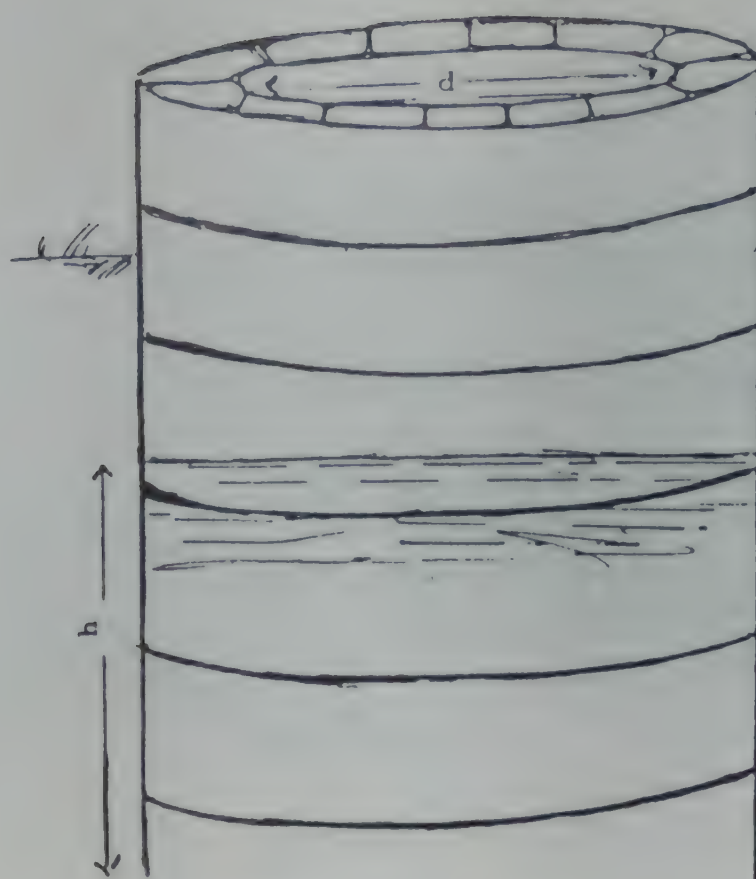
- Water should be clear.
- Usual dose is 2.5 GM per 1000 litres of water unless chlorine demand is known.
- Contact period of 1 hour necessary.
- If water is grossly polluted, use large doses of bleaching powder. Remove excess Chlorine by adding Sodium Sulphate or Sodium Thiosulphate 1 kg/60,000 litres.

Double Pot Method Of chlorination



- Outer pot A has a hole 1cm near the bottom.
- Inner pot B has a hole 1cm near the top and contains bleaching powder - Sand mixture (1:2)
- Mouth is covered tightly with a plastic bag.
- The pots are immersed in water at least 1 metre deep. Utility period is decided by the quality of water being chlorinated.

Chlorination of Wells



d = diameter of well

h = height of water

$$\text{Volume of Water} = \frac{d^2 h \times 1000}{4} \text{ L}$$

$$= 785.7 d^2 h \text{ L}$$

Bleaching Powder required -

$$= \frac{2.5 \times 785.7 d^2 h}{1000}$$

$$= 1.96 d^2 h \text{ gm}$$

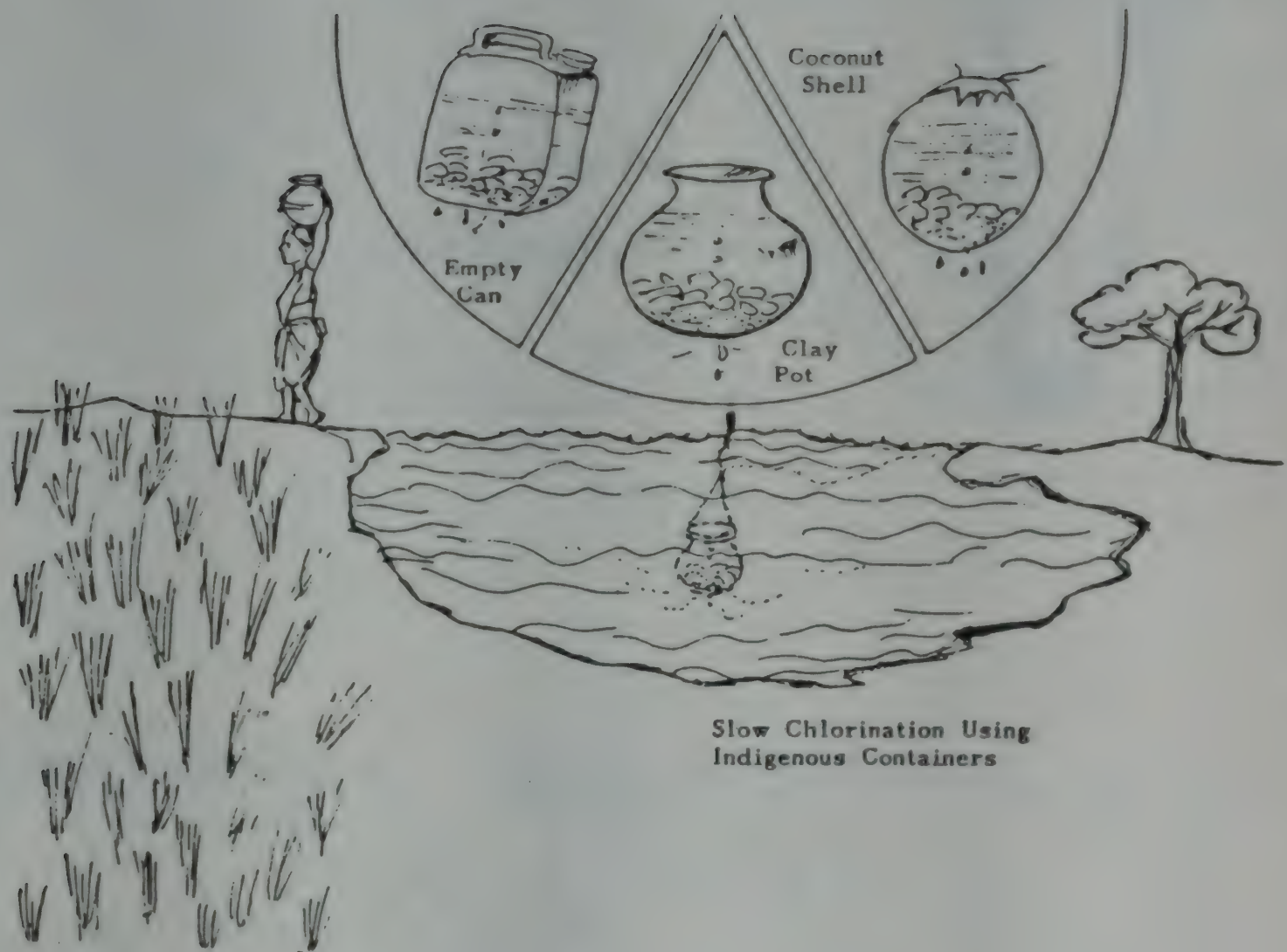
Steps Of Chlorination During Epidemics

- Tie a stone to a long rope and drop it into the well.
- Measure the length of rope which is wet. This gives us the height of water - h metres.
- Measure the difference across the mouth of the well i.e. its diameter - d metres.
- Find out the quantity of bleaching powder needed.
- Make a paste of that powder in water. Add more water to 3/4 bucket and allow it to settle.
- pour the clear fluid into another bucket and lower it into the well, shake it up and down mixing it with well water.
- Allow one hour before using the water.

Ring Size	Volume of Water (litres)	Bleaching Powder Needed
4' x 1 1/2'	509	1/4 teaspoonful
4' x 1/2' x 1'	429	1/5 teaspoonful

Slow Chlorination

Use bleaching powder and sand (1:2).



- Make small holes at the bottom of a clay pot, coconut shell, used plastic container.
- Add some stones for weight.
- Fill with the above mixture.
- Immerse the container in the well or tank and secure it with a rope.
- The mixture has to be replaced periodically.

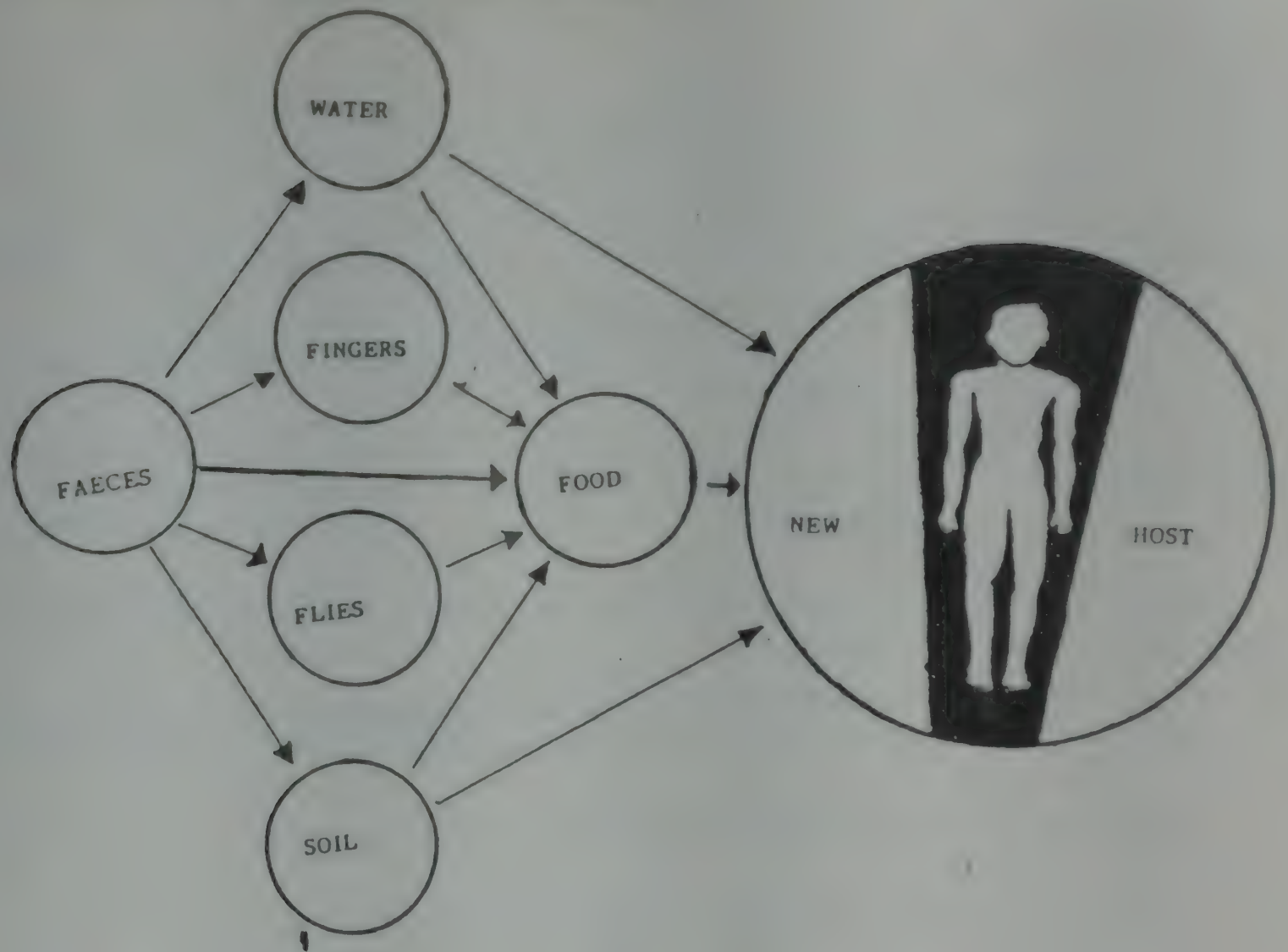
SANITATION

Typical Unsanitary Situation Leads To :

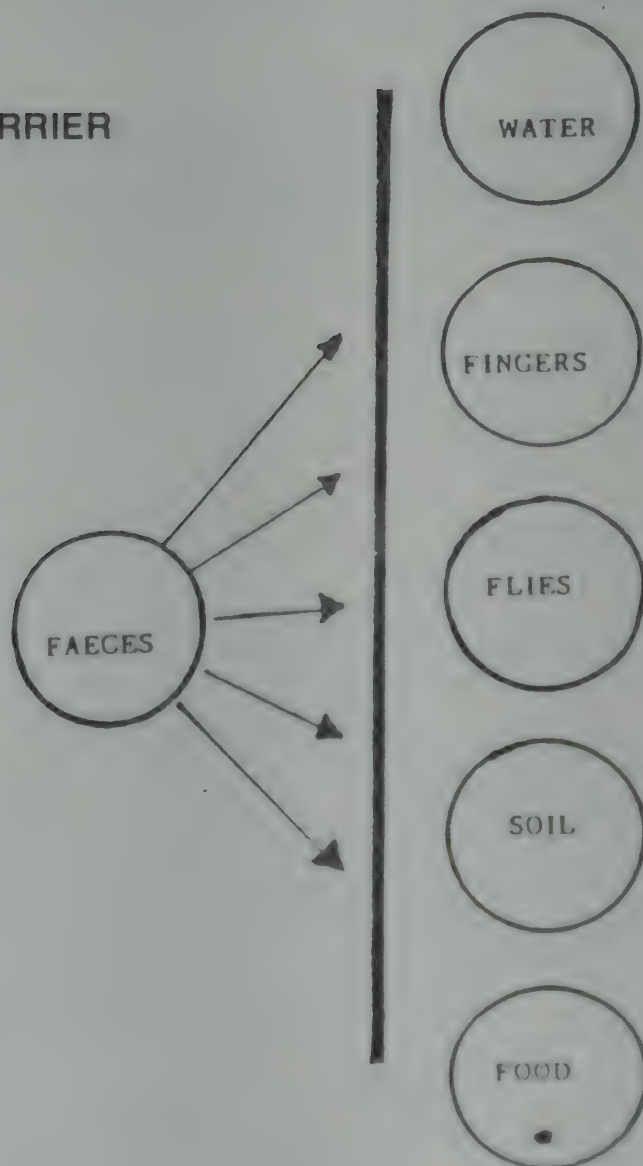
- diarrhoea.
- Worm infestation
- illness
- depression
- smell



TRANSMISSION OF DISEASES FROM FAECES



SANITATION BARRIER



Sanitary Latrines

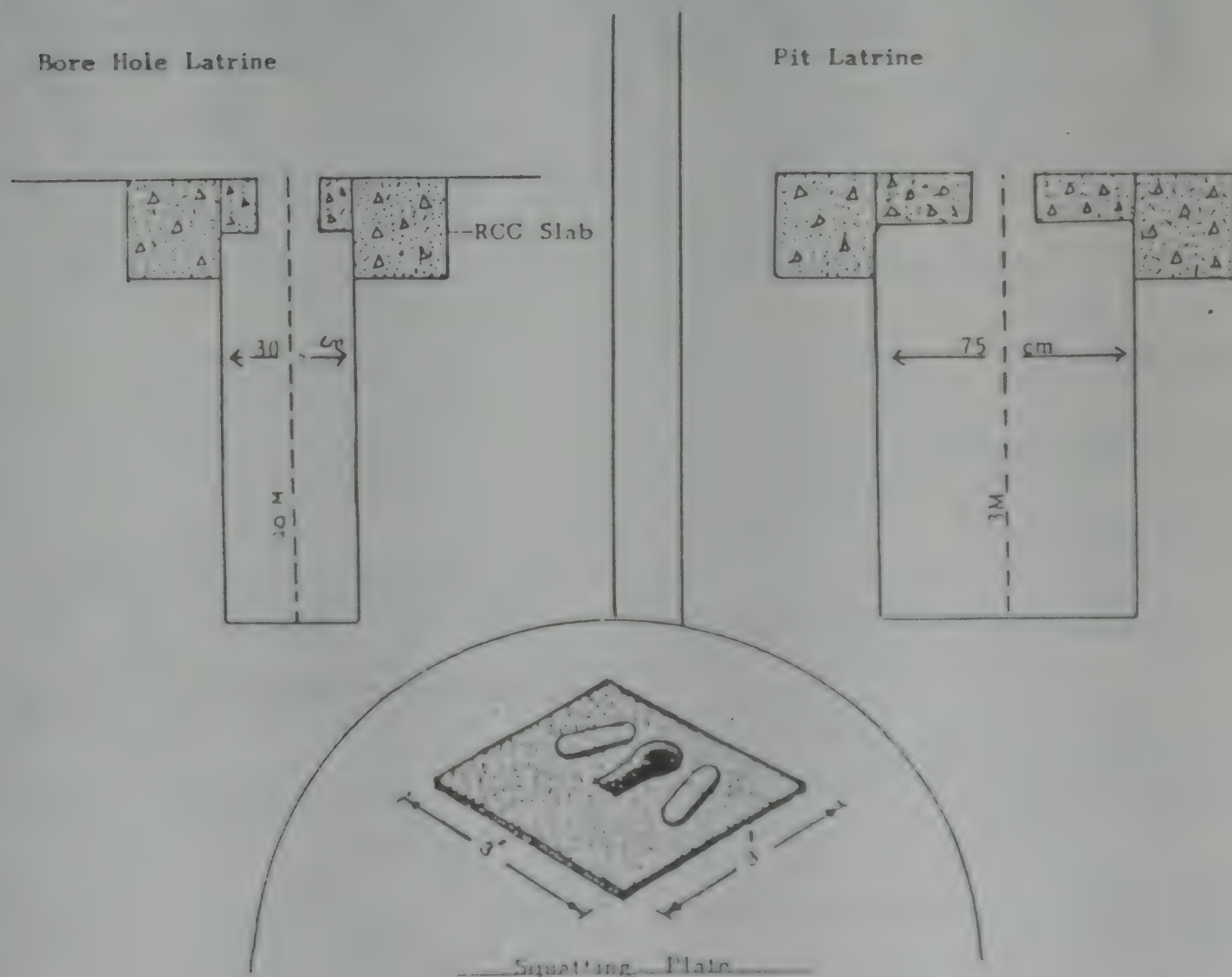
- Excreta should not contaminate the ground or surface water.
- Excreta should not pollute the soil.
- Excreta should not be accessible to flies, rodents, animals (pigs, dogs, cattle etc.) and other vehicles of transmission.
- Excreta should not create a nuisance due to odour or unsightly appearance.

Borehole Latrine:

- This is a variation of the pit latrine.
- Special equipment is needed to dig the pit.
- This is a deep vertical hole with squatting slabs on either side.
- This fills up faster than an ordinary pit latrine.
- It is prone to fly and mosquito breeding.

Pit Latrine:

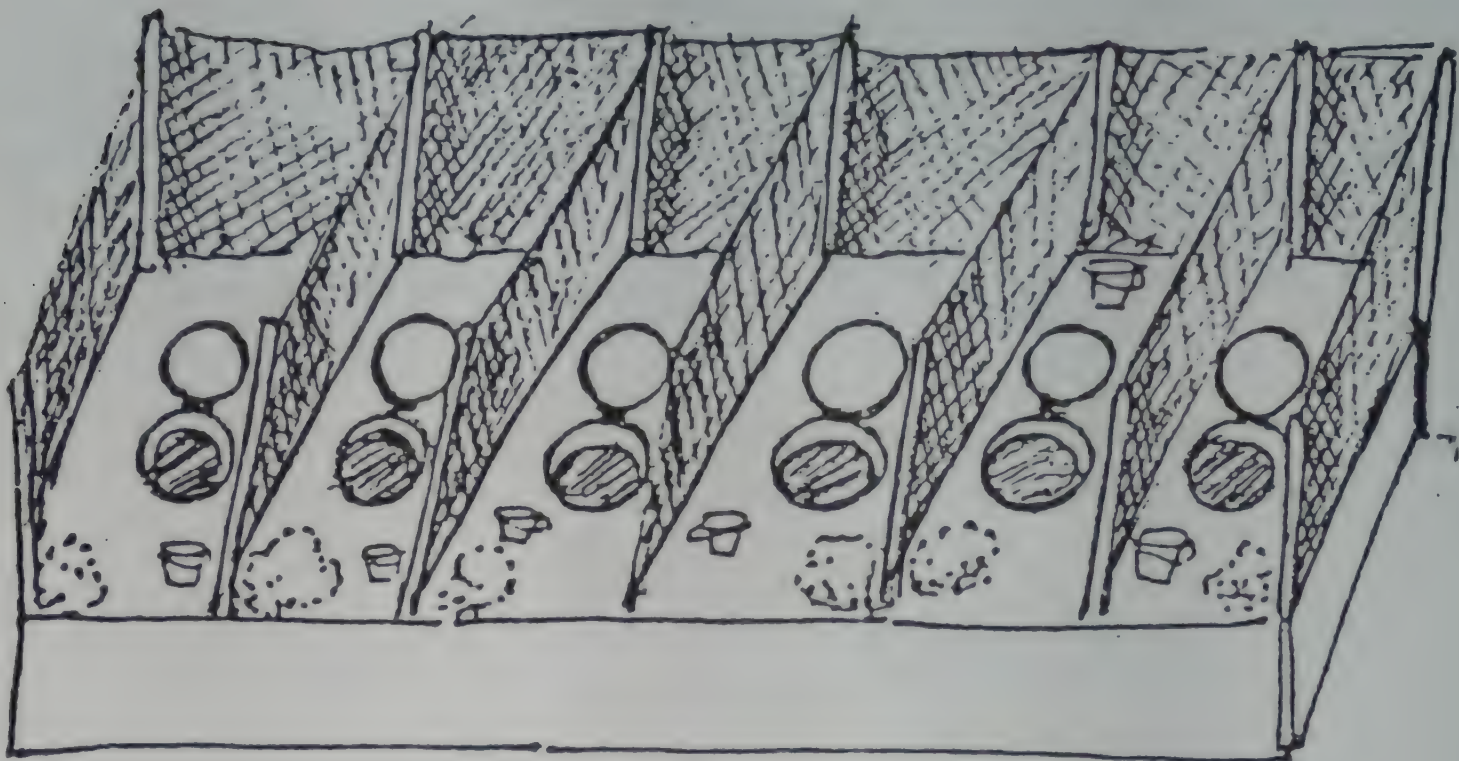
- This is the most common sanitation facility used in an emergency.
- A pit is simply a hole in the ground into which excreta fall.
- It has a squatting plate or riser and a superstructure.
- When the pit is filled to within one meter of the surface, the superstructure and the squatting plates are removed and the pit filled up with soil.
- A new pit is then dug nearby.



Trench Latrines

These are for temporary use as for camps and festivals.

A long pit is dug and divided into compartments by means of sack cloth, thatches or wood. In each compartment, the pit is closed on top except for a hole adequate for defaecation. A cover is provided for the hole. In each compartment earth from the trench is piled on a side which is used to cover the faeces after each time of usage. Water for ablution is provided. Super structure could be provided with poles and thatched leaves.



DIMENSIONS

Length = 10 feet per 1000 people.

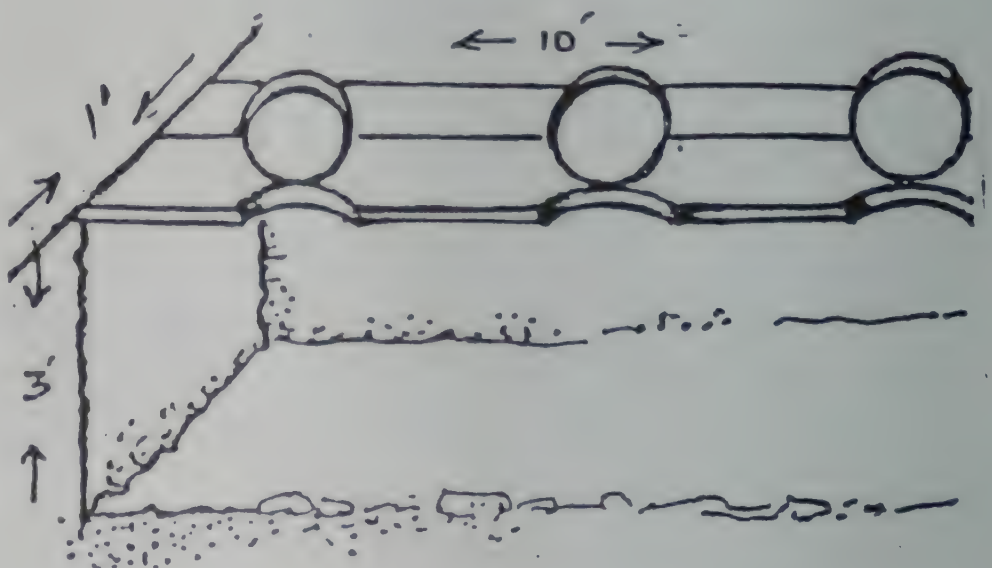
Width = 1 foot.

Depth = 3'-5' if temporary. 6'-8' if for more than 1 week.

When the trench is filled up to 1' below ground level, it is covered with earth heaped above ground level and compacted.

Separate trenches are provided for women and men.

It is supervised atleast twice a day to ensure cleanliness.



CAUSES OF FIRE

Fire is a major destructive agent that accompanies natural disasters. Also, fire occurs due to our carelessness and ignorance. The negligence of one person often results in huge loss of life and property. Housewives careless over kitchen fire, smokers forgetting to extinguish the lighted butt of the cigars, children playing with matches, burning lamps left unattended - all these can result in a fire breakout leaving behind a trail of devastation.

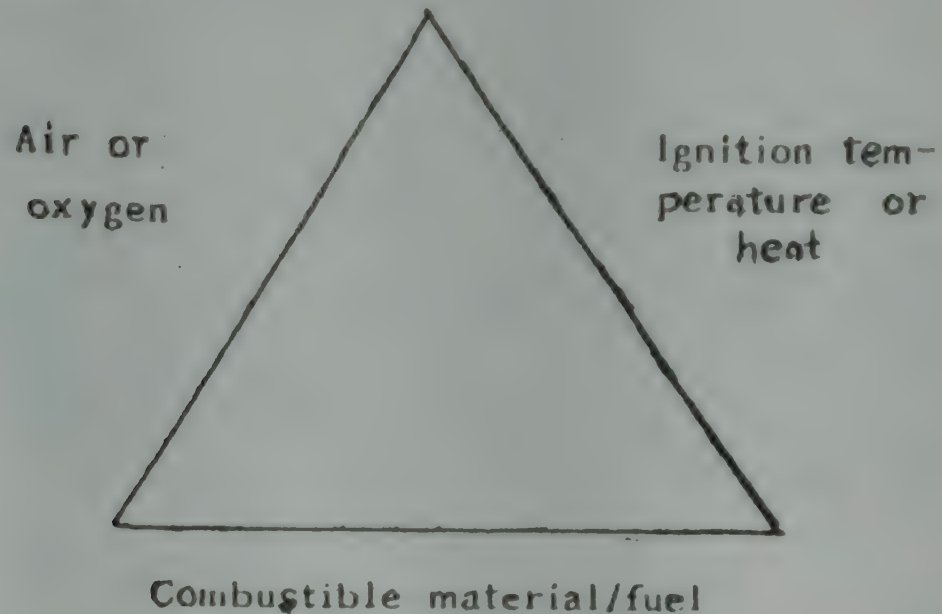
No doubt fire prevention is better than fire fighting. But in the eventuality of a fire, one should know how to put it out. One can arrest the fire only if one has the elementary knowledge of fire fighting methods, rather than waiting for a fire brigade to arrive.

The focus of this Chapter is on the principle of fire breaks and some common sense directives to prevent it. It will come handy to the task forces and enable them to do the job efficiently.

DESTROY FIRE BEFORE FIRE DESTROYS YOU

When light or flame is produced during combustion, it is called FIRE.

Components



Hence a fire can be extinguished if any one or more of these components are removed from the scene.

SPREAD OF FIRE IS DECIDED BY

- Surface area
- Heat generated
- Conductibility of material
- Wind direction and velocity
- Humidity

Enabling Factors.

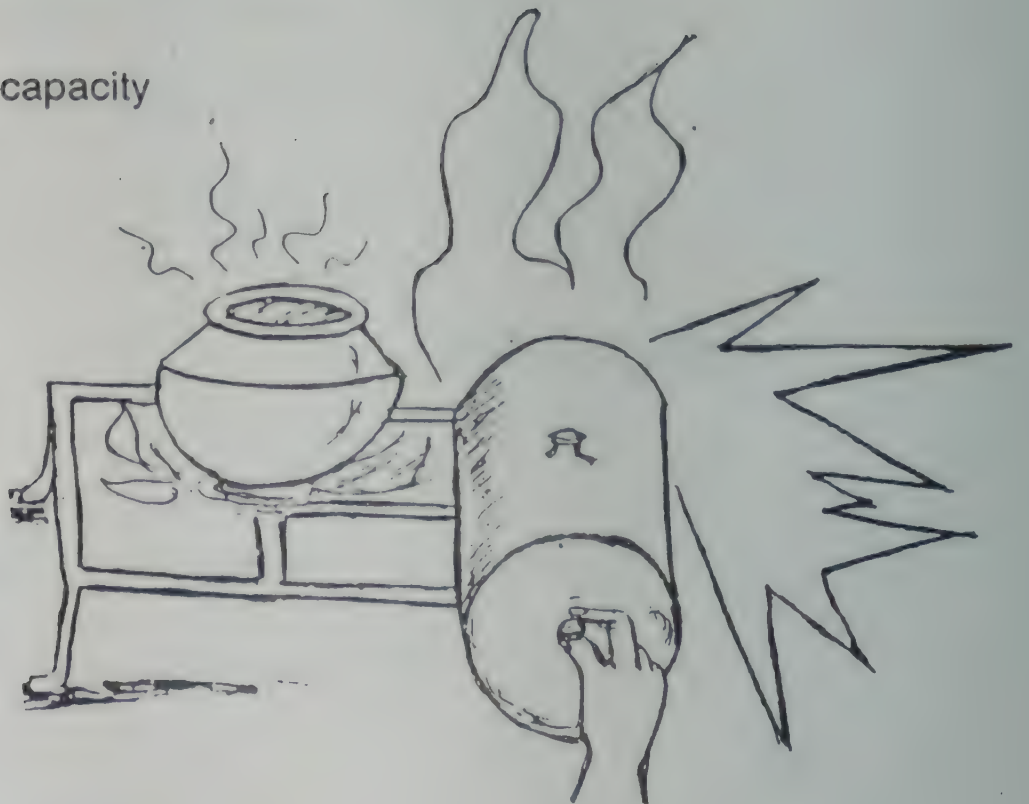
- Wind
- Inflammable material
- Proximity/Contact

CAUSES

Nylon clothes touching the fire.



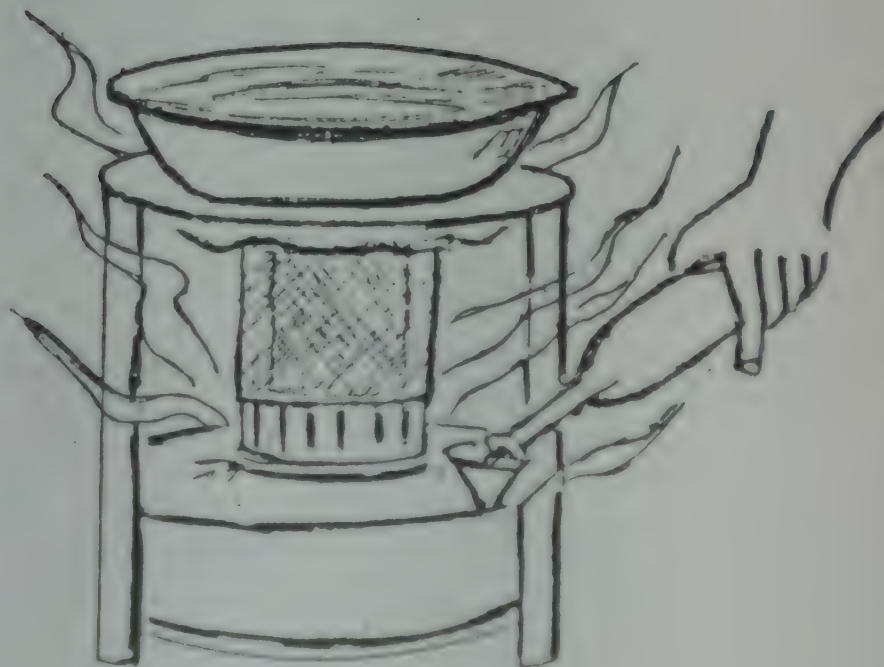
Pumping the stove much beyond its capacity of air makes it burst, catching fire.



In parched , drought prone areas hot rays from the sun could spark off fires early.



It is dangerous to pour fuel into a stove while it is burning.



Smoking in bed and when sleepy results in careless handling of burning match sticks and cigarette butts.



Fire spreads easily with winds:



Fire from burning hut spread easily to neighbouring fields resulting in economic losses.



Before leaving the house ensure that all fires are put off.



CLASSIFICATION

(Based on type of combustible material)

Class A	Paper, wood, grass, cotton etc. which leave ash alone as residue.
Class B	Inflammable liquids, Petrol, diesel, kerosene, spirit etc.
Class C	Petroleum Gas.
Class D	Metals, such as rusted iron, phosphorus, mercury.
Class E	Electricity.

Precautions.

- Handle fire carefully.
- Keep fuel/inflammable material away from fire.
- Switch off electric gadgets soon after use.
- Do not leave children near fire.
- Leave space between roof and walls in thatched houses.
- Do not build thatched houses very close to each other.
- Have ready access to fire hooks, fire extinguishers, water and sand in risky situations.

Effects

Economic loss

Loss of lives

Burns and disfigurement

BURNS AND SCALDS

Causes .

- Boiling liquids, red hot metal, sun, steam.
- Electricity - naked metal wire
- Strong chemicals - acids and alkalis.

Effects.

- Redness of skins
 - Boils
 - Tissue destruction
 - Loss of body fluids and shock
 - Scars/deaths
-
- Handling hot metal



Treatment Of Burns

- Reassure the victim and keep him quiet.
- Do not touch the affected parts unnecessarily
- Wash your hands thoroughly before attending to burns.
- Do not remove victims's clothes.
- Do not use lotions to treat wounds.
- Only vaseline or gentian violet to be applied.
- Cover the burnt area with sterile or very clean cloth or cotton.
- Do not apply bandage tightly if there are boils.
- Do not burst open the boils.
- If burns are severe do not feed the victim with anything but water as it may be required to anaesthetise the victim for treatment.
- For mild burns, give adequate fluids to the affected person.
- If face is burnt prop the victim up and keep under continuous observation for breathing difficulty. An open airway may be necessary.

METHODS OF FIGHTING FIRE

Fire Extinguishing Methods

Starvation

Removal of burning material from the fire or removing the fire from the material.

Eg : Class A

Cooling

Lowering the temperature of the burning materials to a point below ignition point.

Eg : Class A and Class D using water.

Smothering or Blanketing

Restricting the supply of oxygen/air by covering the burning material with sand/foam/dry earth.

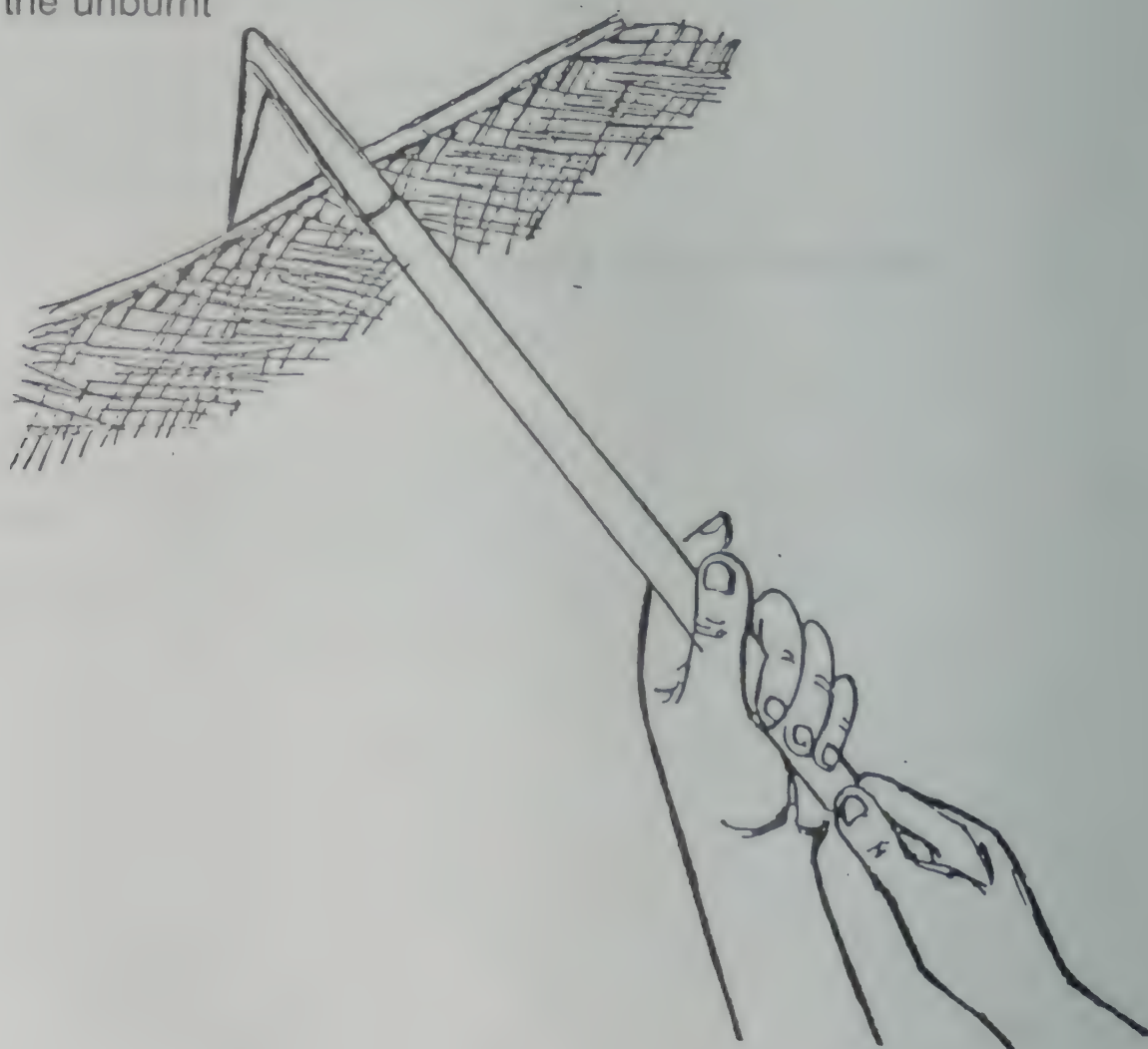
Eg : Class B and Class D.

Methods of extinguishing fire by the joint efforts of Task Forces in the villages.



Remove the burning thatch with a long pole attached to a hook.

As a safety measure remove all the unburnt thatches.



Extinguish the fire with a pole on which a piece of tin sheet is nailed.



Blow off the fire with wet gunnies.



Blow off the fire with branches having green leaves.



Throw sand on the burning fire.

Mamotty, winnow could be used.



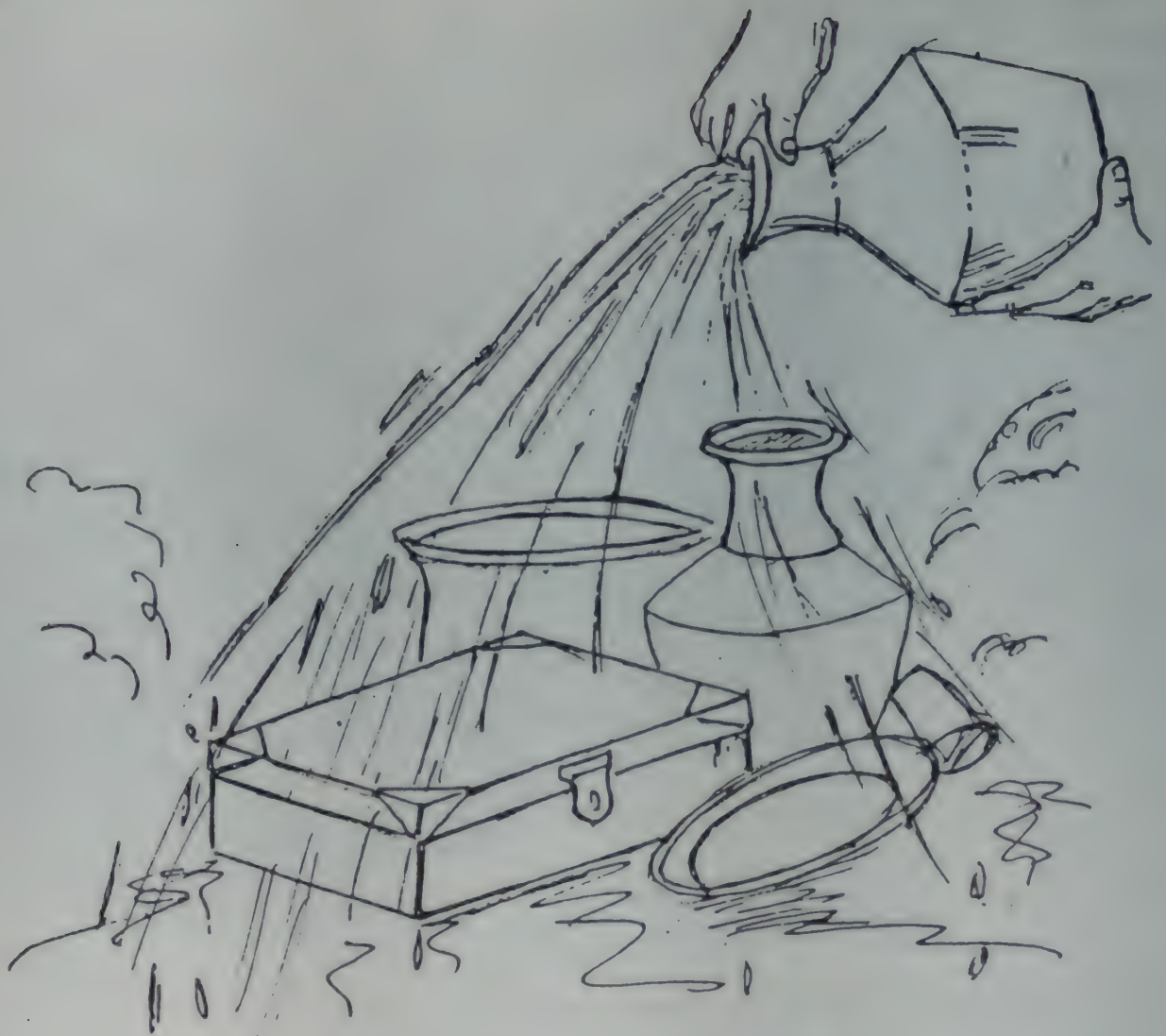
As a precautionary measure remove all the unburnt thatches from the neighbouring houses.



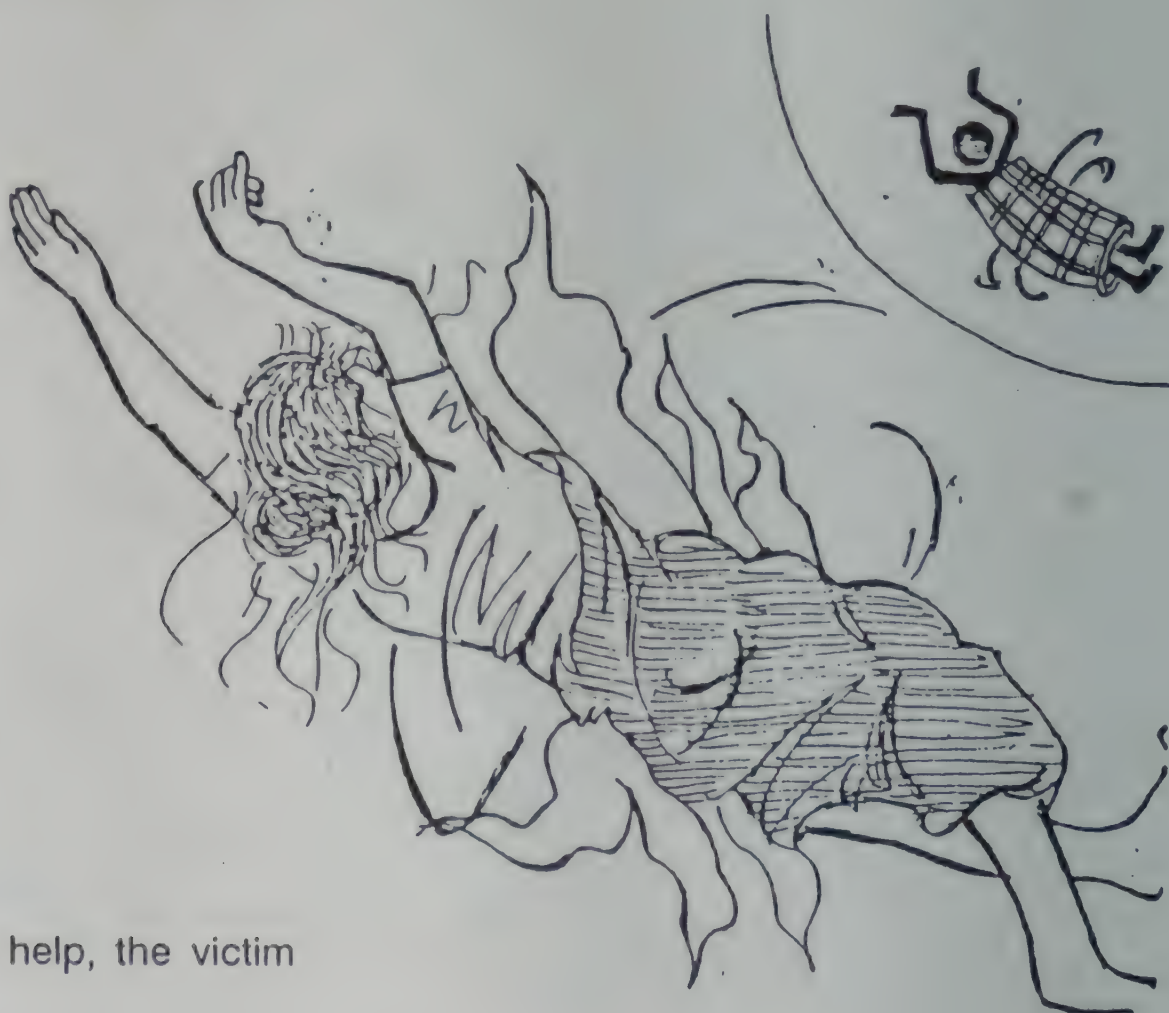
The thatched roofs of the houses near the burning house should be made wet with buckets of water being poured on them.



Safeguard the household articles by pouring water on them.



Wrap a wet blanket/gunny on a person who catches fire and roll that person until the fire blows off.



If there is no one near to help, the victim should roll on the ground.

By pouring water, the heat in the body of the victim could be brought down and injuries minimised.

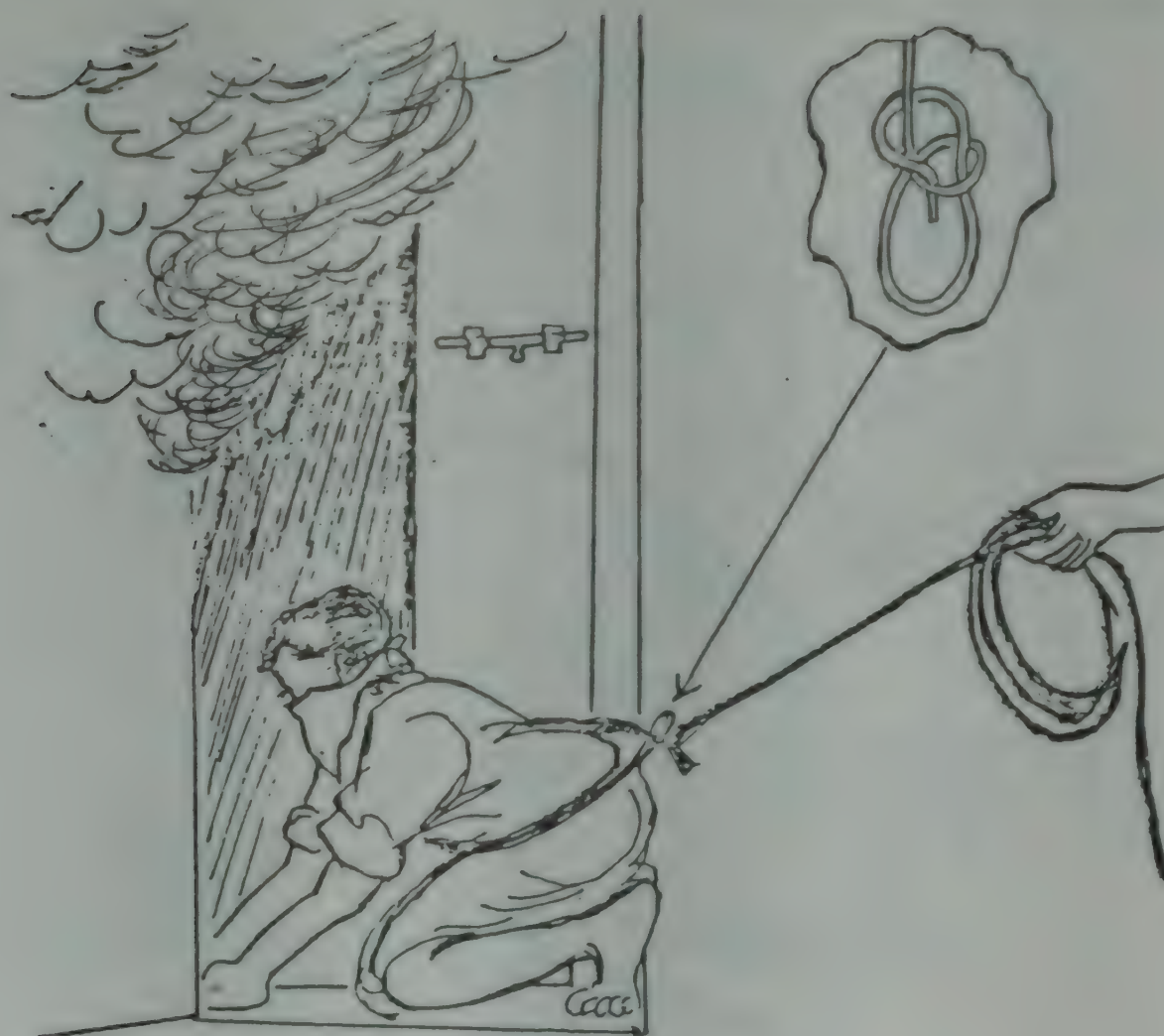


RESCUE OF FIRE VICTIMS



If the building that is destroyed by fire is of brick, smoke filled, then

Stand in hiding near the door, cover face with a wet cloth. bend down and slowly open the door to prevent being smothered by smoke.



As the carbon monoxide is very high in a smoke filled room, bend and crawl on your knees to enter.

The rescuer should tie a bow line knot around his waist, hand this knotted rope to a person outside the room and then alone get inside the smoke filled room. If he feels faint due to the monoxide he could signal by tugging the rope and this will help to save him.

An unconscious victim inside the room may be pulled out by Crawl Method.



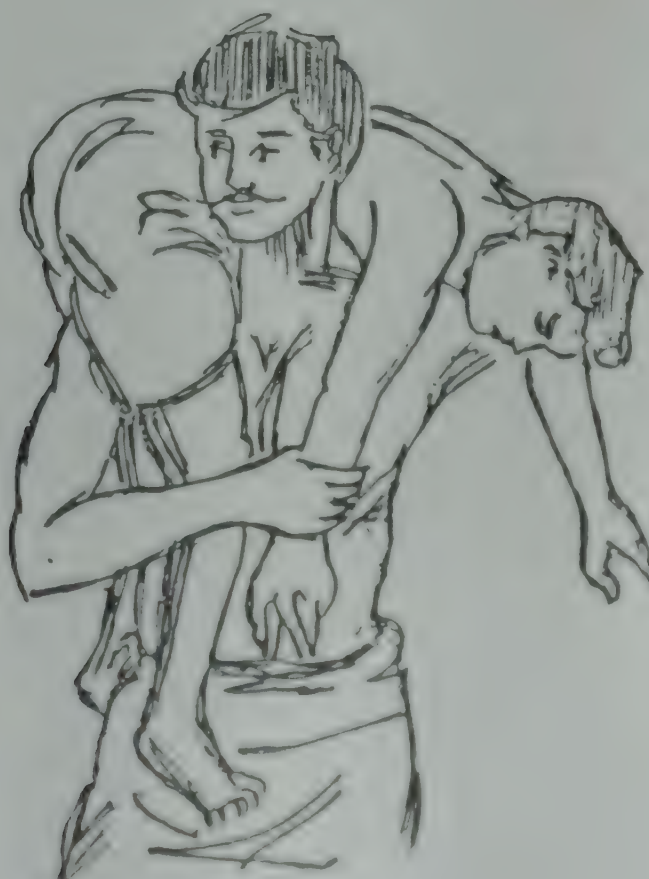
Victim being saved by bowline drag method.



Victim rescued by toe dragging.



A convenient way to carry a victim. '



SAFE HANDLING OF PESTICIDES

Pesticides, fertilizers, high yielding varieties of seeds have become part of the modern agricultural package. Viewed globally, the levels of pesticide use in India have not reached a high like in other market oriented subsidy based farm economies. What causes concern, however, is the total disregard of safety measures and a lack of awareness of pesticide hazards at the user level. The most vulnerable sections of our society routinely handle these chemicals with little or no thought to their long term effects.

It is necessary to have educational and awareness campaigns on the judicious use of agro-chemicals in conjunction with other pest control methods, and not in isolation.

However, to tackle the immediate threat of "Slow disasters" in our environment and people, the knowledge of basic safety measures in purchase, storage, and pesticides use is essential.

In this section , the use of pesticides at the field level and precautions in handling them are illustrated.

WHAT ARE PESTICIDES?

- Pesticides are chemicals used to control pests or diseases that attack crops.
- It controls insects, fungi and weeds.

Classification

By the type of pest on which they are designed to action :

- Insecticides for insects.
- Herbicides for herbs.
- Fungicides for plant diseases.

By their chemical composition:

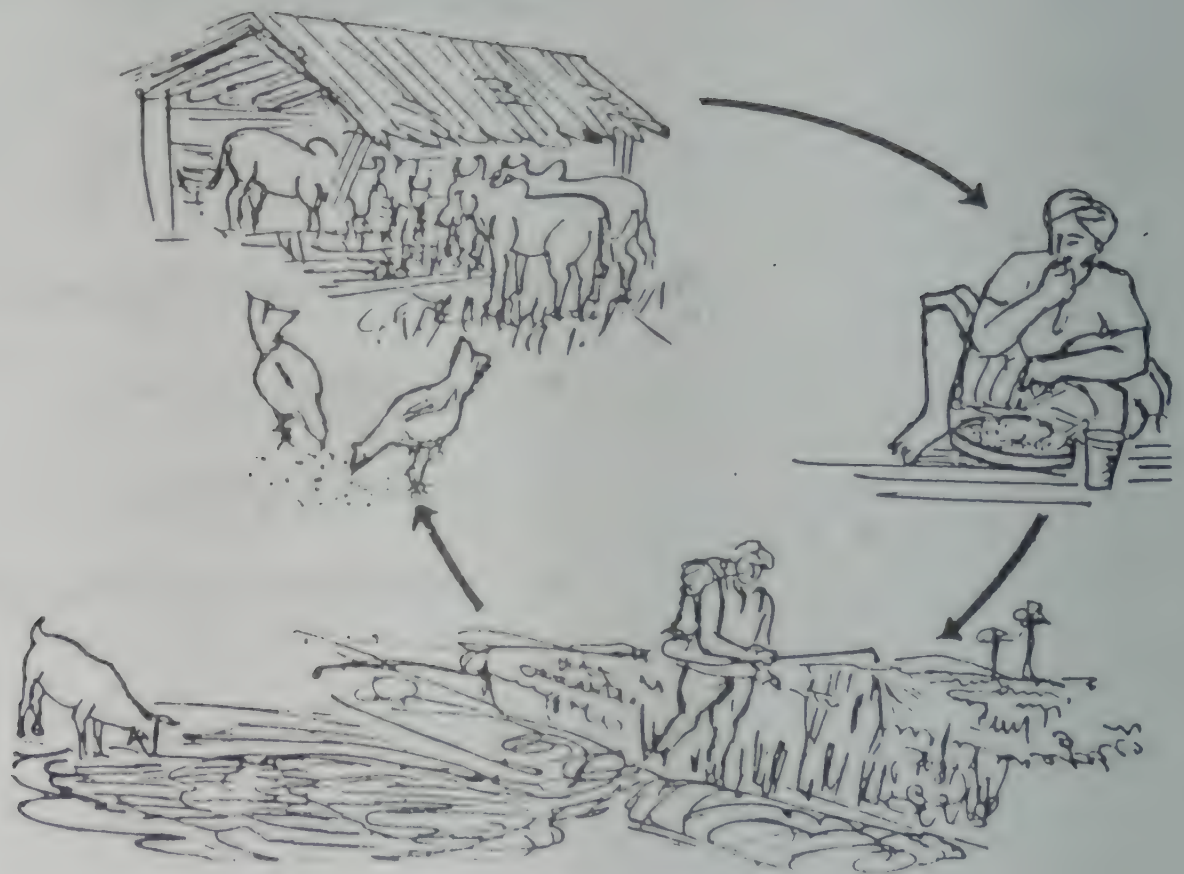
- Organochlorines (DDT)
- Organophosphates (Parathion, Malathion etc.)

Pesticides Are Harmful

- Pesticides are toxic substances.
- They affect living organisms.
- They are dangerous to human beings if the exposures are high and for long duration.



Pesticides Do Not Disappear

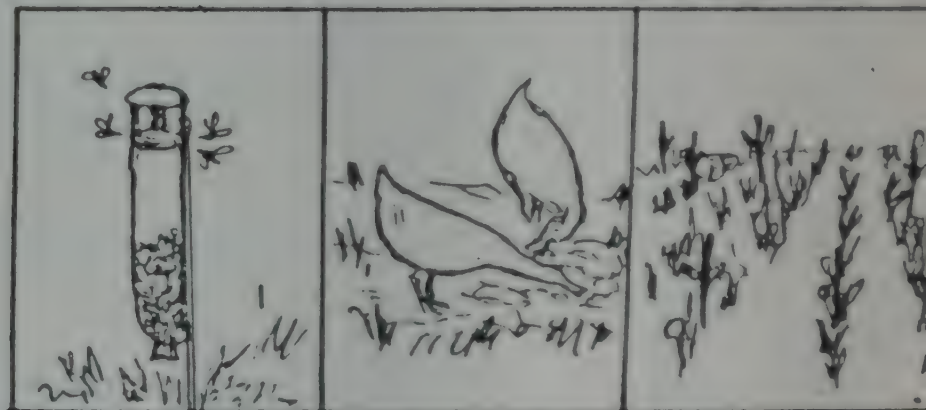
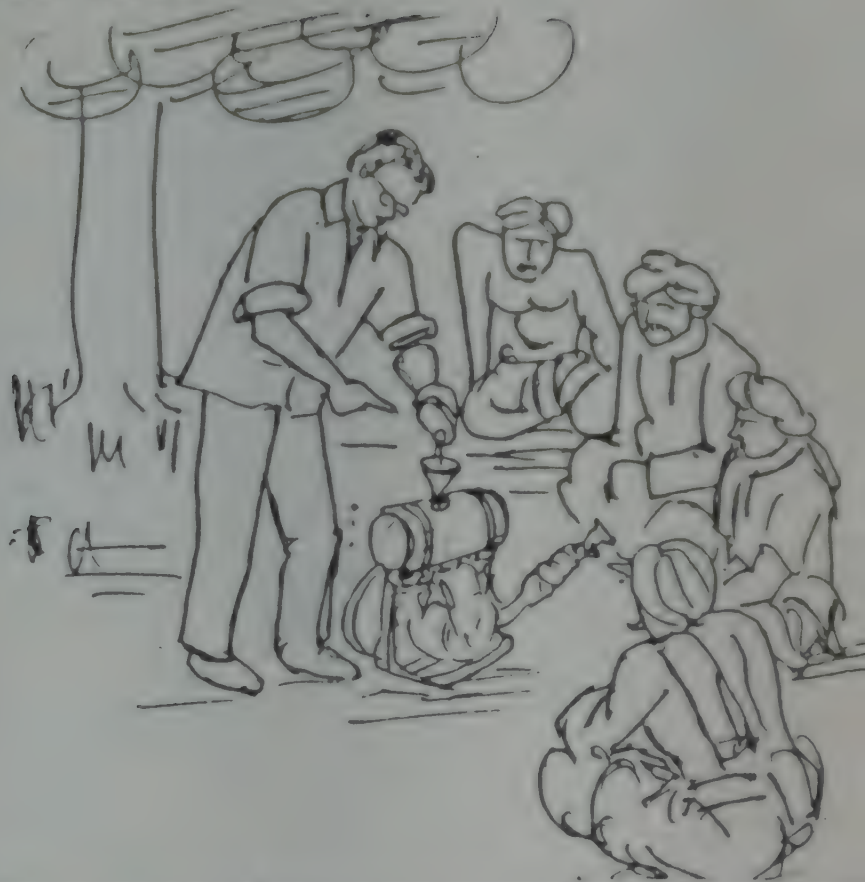


- They pollute our water, soil and environment.
- They contaminate our food chain.
- Therefore, they are present in our body fat as residue.

Pesticides Are Toxic

Users must be trained to :

- Handle pesticides carefully.
- Use correct pesticide on the crop.
- Observe field safety measures.
- Use pesticides only when necessary.
- Use them along with other pest control methods.



Buy The Right Product

- Do not accept or buy damaged packs
- Check the seals, they must be intact.
- Buying more will create storing problems.
- Do not transfer pesticides into other containers.

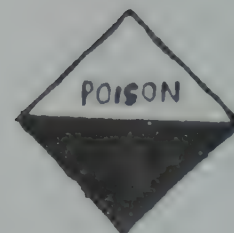
Every Pesticide Container Has A Label



- Label carries information on toxicity of the pesticide.
- Read label carefully for dosage and dilution.
- Use correct dosage.
- High dosage will NOT produce better effects.



RED



YELLOW



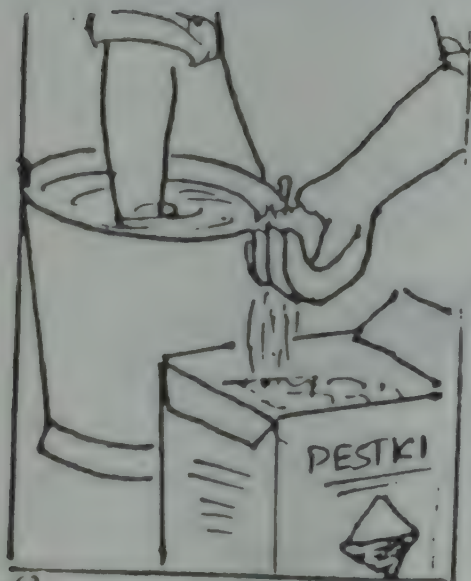
BLUE



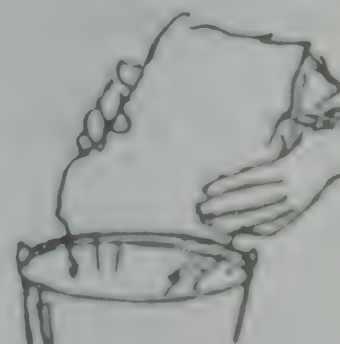
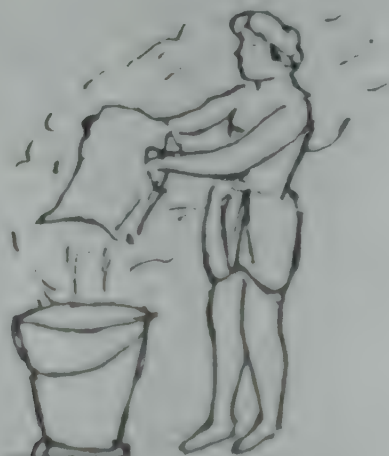
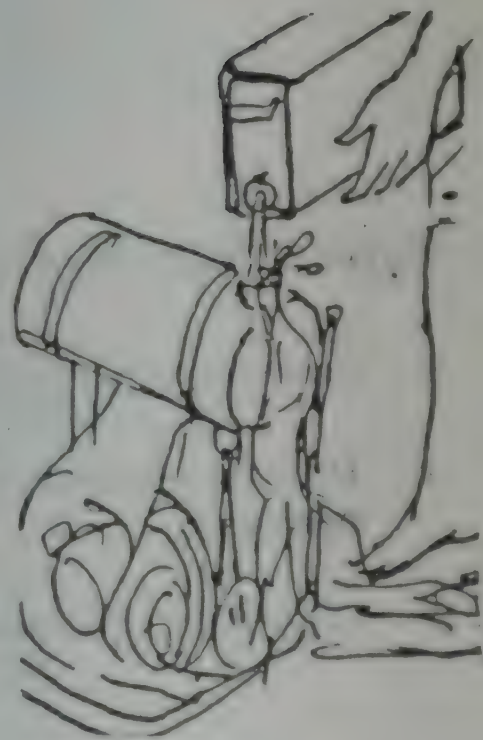
GREEN

MIXING AND HANDLING OF PESTICIDES

Do Not Allow Children To
Handle or Mix Pesticides



- Mix pesticides in open or well ventilated place.
- Mix them away from houses, livestock.
- Do not use hands to take out or mix pesticides. Use sticks or bamboo.
- Always use graded, suitable measures.
- pour liquid pesticide carefully to avoid splashing.
- Always stand with wind at your back while mixing or loading pesticides.



WHILE SPRAYING

ALWAYS SPRAY DURING THE COOLER PART OF THE DAY

ALWAYS SPRAY WITH THE WIND AT YOUR BACK

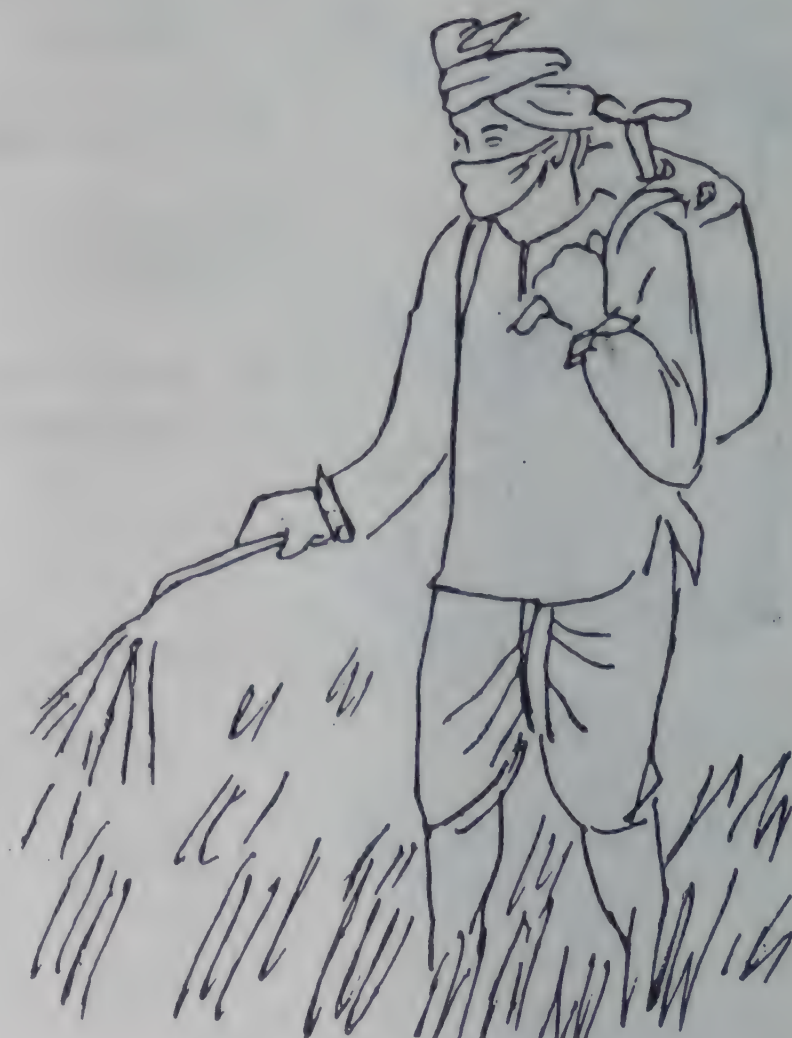


Protect Your Mouth And Nose

- Cover them with a piece of cloth.
- Do not use towel or turban. They will be soaked.
- Use a separate piece of cloth.

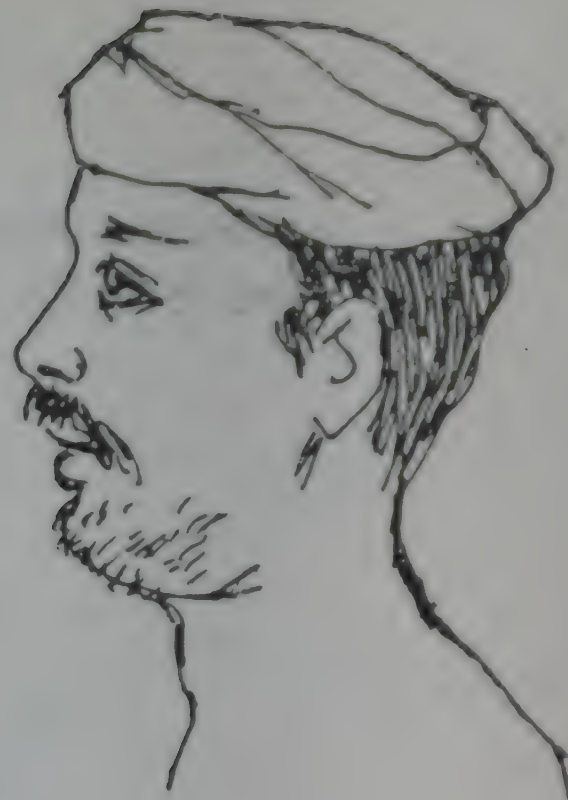
Protect Your Body

- Cover lower limbs with full dhoti.
- Cover torso with a full sleeved shirt.



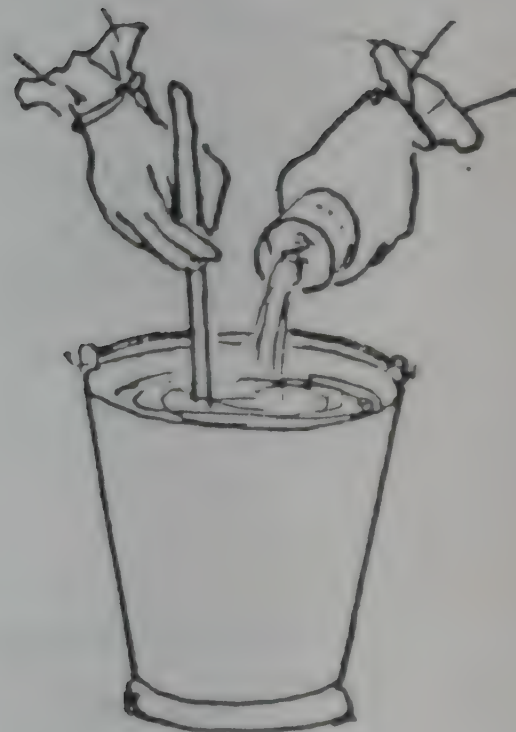
Protect Your Head

- Hair can accumulate dust or liquid.
- Wear a turban or tie a towel around the head.

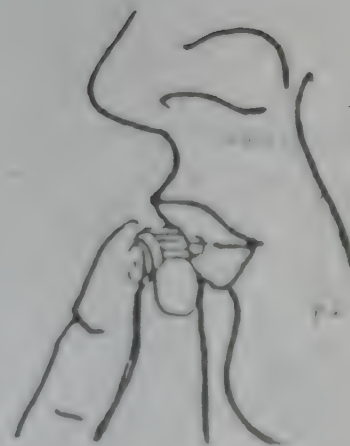


Protect Your Hands

- Use gloves so that the skin is not exposed to pesticides.
- Gloves provided in the container are flimsy. They do not last long.
- Instead, use plastic bags to cover your hands.



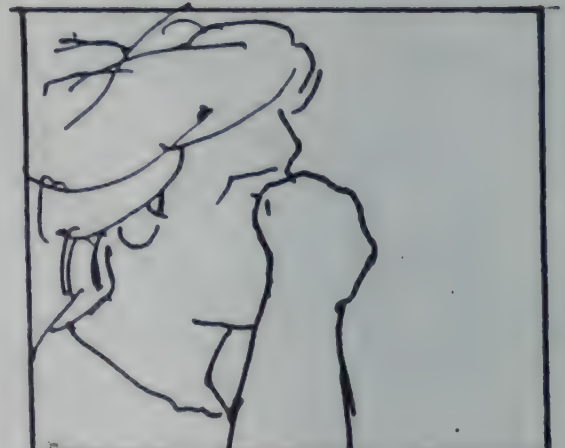
DO NOT CLEAR BLOCKED NOZZLE WITH YOUR MOUTH.



NEVER USE DEFECTIVE SPRAYERS, THEY CAN DRENCH
YOUR BODY AND CONTAMINATE YOU.



DO NOT SMOKE, DRINK, OR RUB YOUR EYES AND FACE
WHILE USING PESTICIDES.



AFTER SPRAYING

- Wash body thoroughly with soap and water.
- Wash hair, finger nails, toe nails, armpits and thighs.
- While washing, take care to keep the water out of your eyes.
- Soak your clothes separately in soap and washing soda for 1 1/2 hours. Wash with clean soap and water.
- Empty the sprayer completely while spraying. If not empty, dispose the left over pesticide under one metre of soil away from water sources.
- Wash, clean the buckets and measuring cups. Also, check the equipment.
- DO NOT reuse the pesticide container however attractive they are.
- Destroy and bury the containers away from people, livestock and water sources.

TRANSPORTATION OF PESTICIDES



- Transport pesticides carefully.
- Do not transport them along with other food stuffs.
- Do not carry pesticide bags on your head.
- Keep details regarding the pesticides being transported antidotes etc. readily available to be used in case of accidents.



IF PESTICIDE CONTAMINATION OCCURS...



Seek medical advice as quickly as possible .

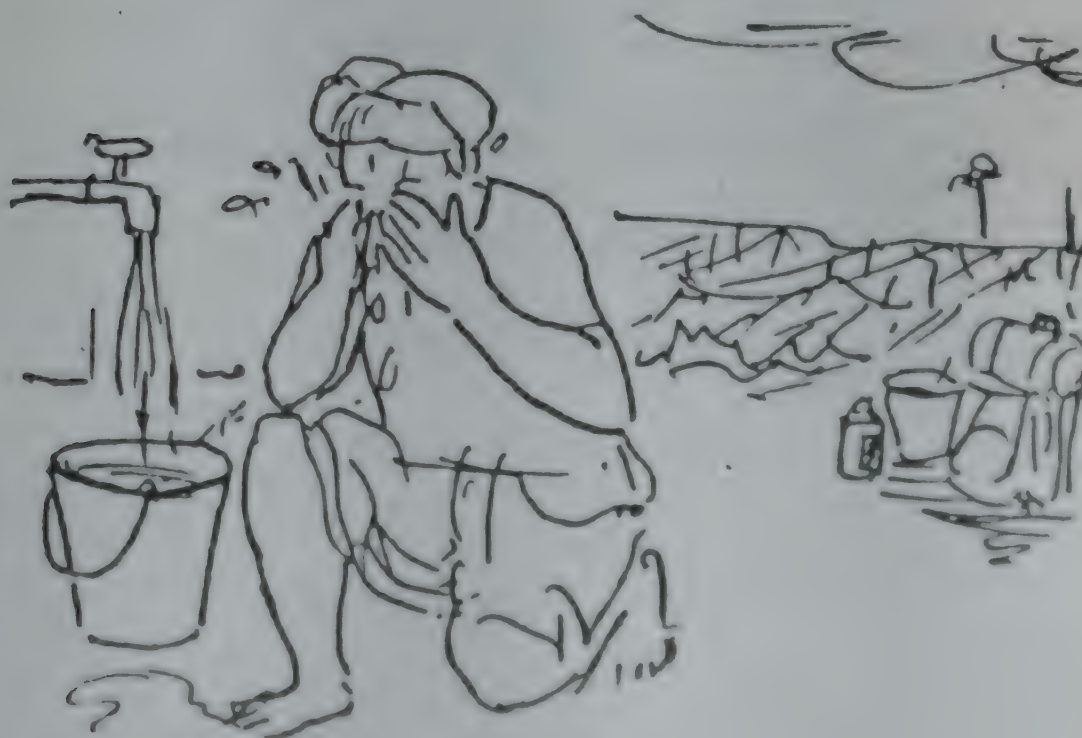
Show the label of the container to the doctor from which the pesticide came.

Loosen clothing around throat and chest in case of pesticide inhalation.

Wash with plenty of water in case of skin absorption.

Remove contaminated clothing.

If pesticide gets into the eyes, wash eyes well with clean water for 10 minutes.



ALTERNATIVE PEST MANAGEMENT

EDUCATE AND TRAIN COMMUNITIES IN ALTERNATIVE, SAFER METHODS OF PEST MANAGEMENT.

The Other Methods Are :

- Control by natural enemies (Bio-Control).
- Control using plant products (Use of Botanicals).
- Physical or mechanical control.
- Control by other agronomical practices.
- Control using animal products.
- Control by water management in the field.

Control Using Plant Products

GARLIC



NEEM



Cultural Control

- Blocking holes created by pests.
- Production of continuous sounds thereby disturbing mating of pests.
- digging field bunds and catching rats.
- Leaving rice at the corners of each fields - Birds eat up this and therefore do not attack the crop - and consequently eat the worms around.

Agronomical Practices

- Mixed cropping - Having different crops in same field.
- Crop rotation - Cereal rotated with pulse
- Burning stubbles after harvest
- Synchronised sowing.
- Use of trap crops.
- Use of resistant varieties.
- Use of humus to prevent attack by pests

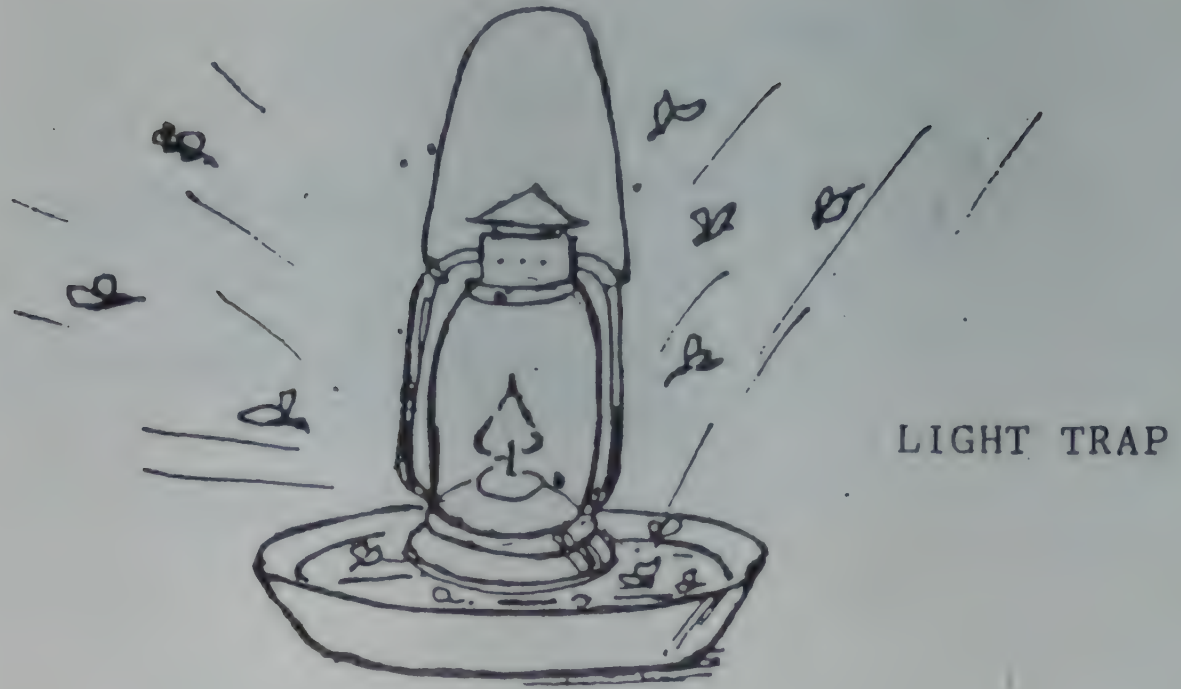
Animal Products

- Using Cow dung.
- Storing seeds in container plastered with Cow dung.
- Application of mixture of nematodes and earth to infected parts.
- Avoidance of fresh Cow dung as manure.
- Use of urine of Cow.

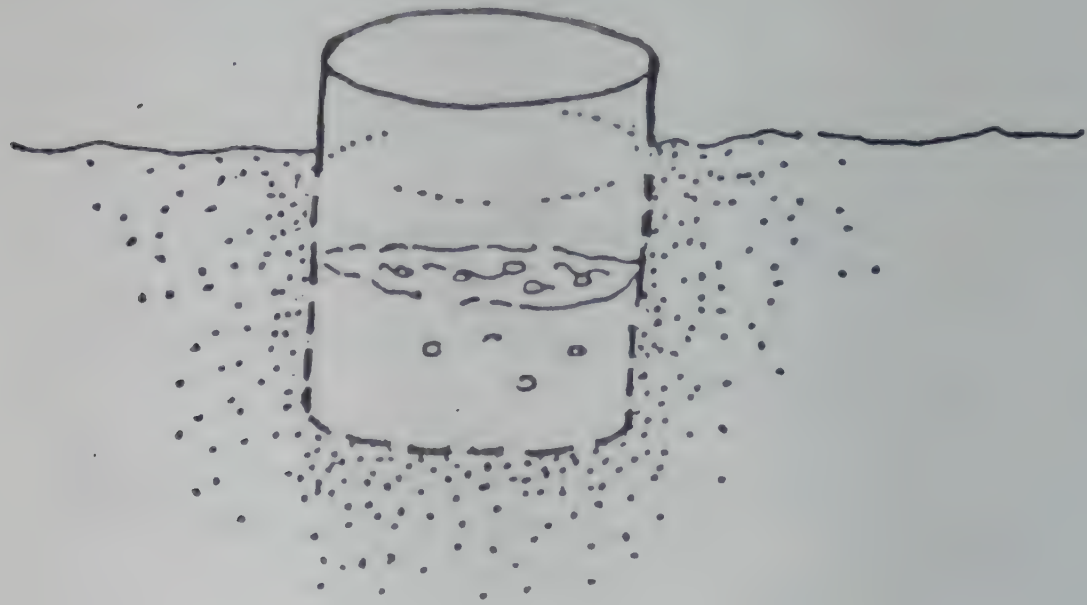
Water Management:

- Flooding the fields.
- Flood irrigation and subsequent draining.
- Irrigation of the clayey soil thereby allowing the weeds to germinate and subsequent ploughing.
- Irrigation after pest attack.
- Converting land heavily infested with weeds into wet lands.
- Constant submergence of the plant for weed control.

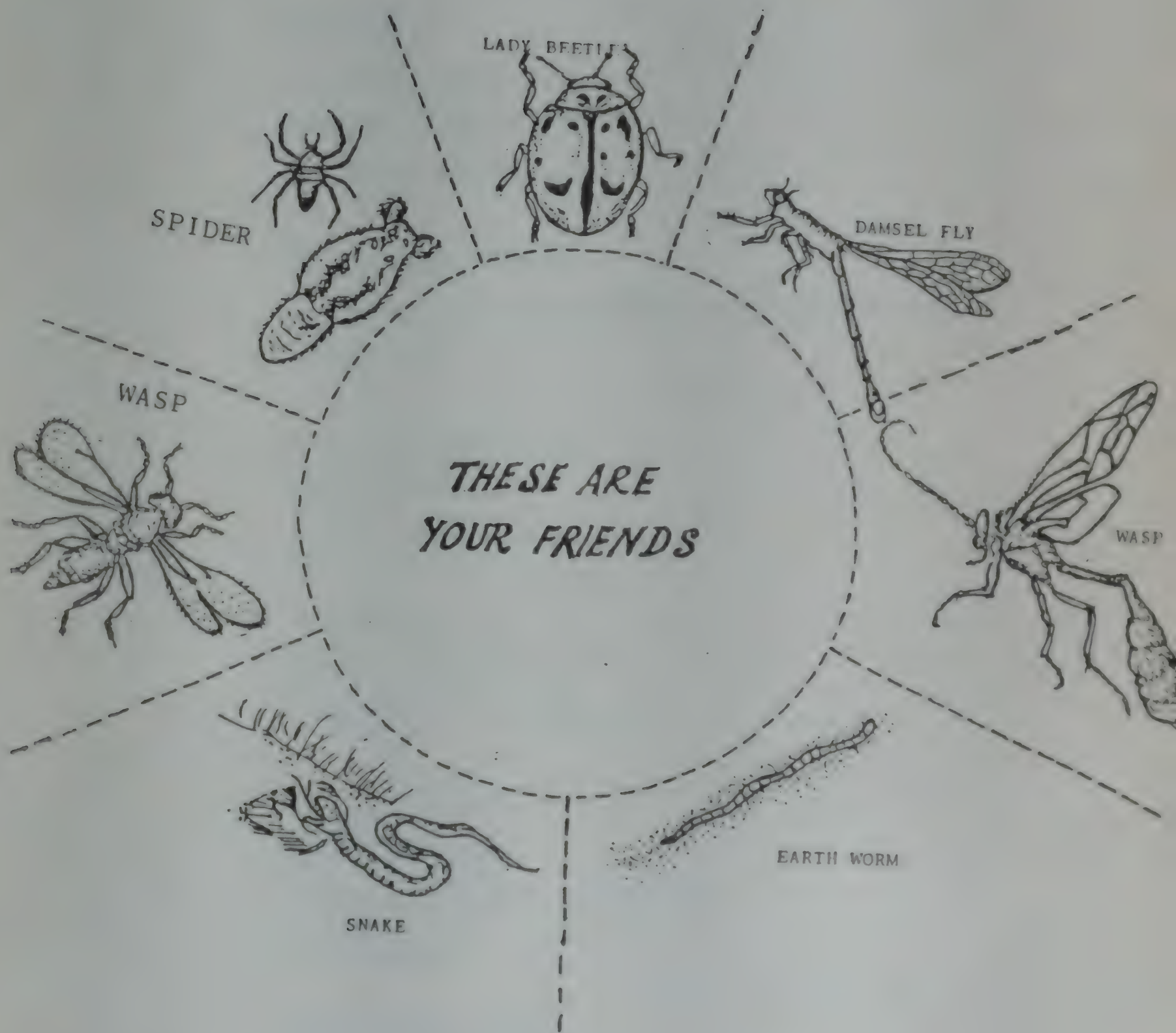
MECHANICAL CONTROL



TRAP FOR RATS AND MICE



EVEN IF YOU SEE THEM DO NOT KILL THEM



Select Bibliography

- 1) Bull David ,
A growing problem
Pesticides and the third world
Published by OXFAM, 1982
- 2) Corporation of Madras,
Contingency Plan to mitigate floods and cyclone in Madras City,
Madras, 1988
- 3) Emergency Manual, Vol-1
Natural Disasters,
Caritas Internationalis, 1981.
- 4) Pesticides---
A Community Action Guide,
CONCERN Inc., Washington ,1987
- 5) ' The Dirty Dozen '
Information Packet,
Pesticide Education & Action Project,
San Fransisco.
- 6) Government of India,
Elementary Fire Fighting and Fire Prevention,
Publications Division, Ministry of Information and Broadcasting.

7) *Government of Tamil Nadu,
Anti-Disaster Plan,
State of Tamil Nadu.*

8) *Grant Harvey, Murray Robert Jr.,
Bergerson David,
Emergency Care,
Third Edition,
Brady Communication Company,
A Prentice-Hall Publishing Company,
Englewood Cliffs, NJ. 1982*

9) *Rosenberg Stephen,
The Jhonson & Jhonson First Aid Book,
Graftson Books,
London 1986.*

10) *WHO Emergency Health Kit,
Standard Drugs and Clinic equipment for
WHO, Geneva, 1984.*



